AMIGA WORLD

May/June 1987
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The New Amiga 500!

Expanded Review Section

Fantastic Graphics

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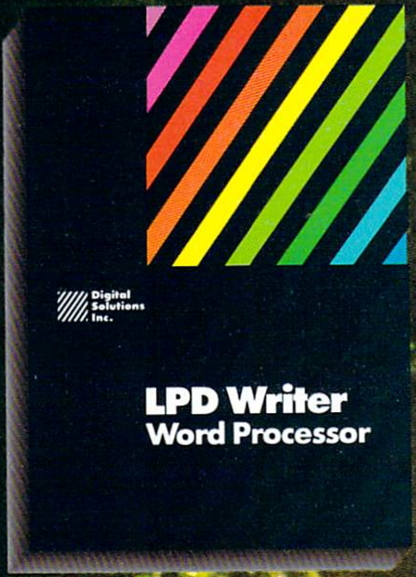
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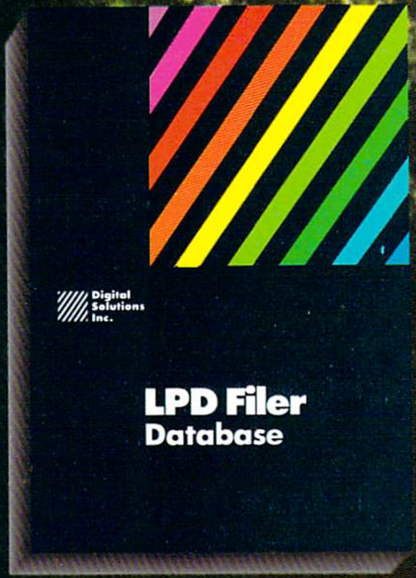
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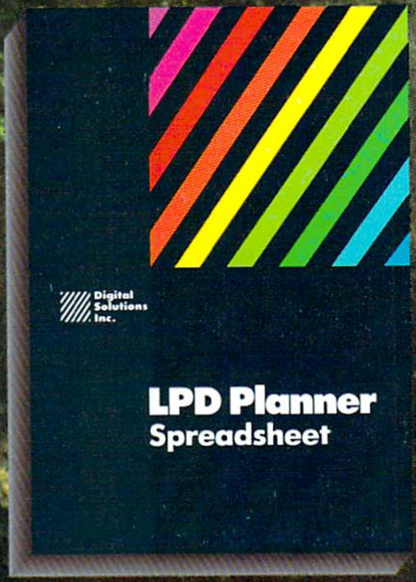
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- multi-page record layouts
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- user-definable order of field entries and default field values
- calculations during record entry
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- report generation including headers, footers and record-by-record calculations.

LPD™ WRITER/Word Processor*
- multiple documents can be edited at the same time
- more than one window can be opened on a document
- on screen representation of documents as they will be printed (including line spacing, superscripts and subscripts)
- on screen headers and footers
- underlining, boldface and italic enhancement of text

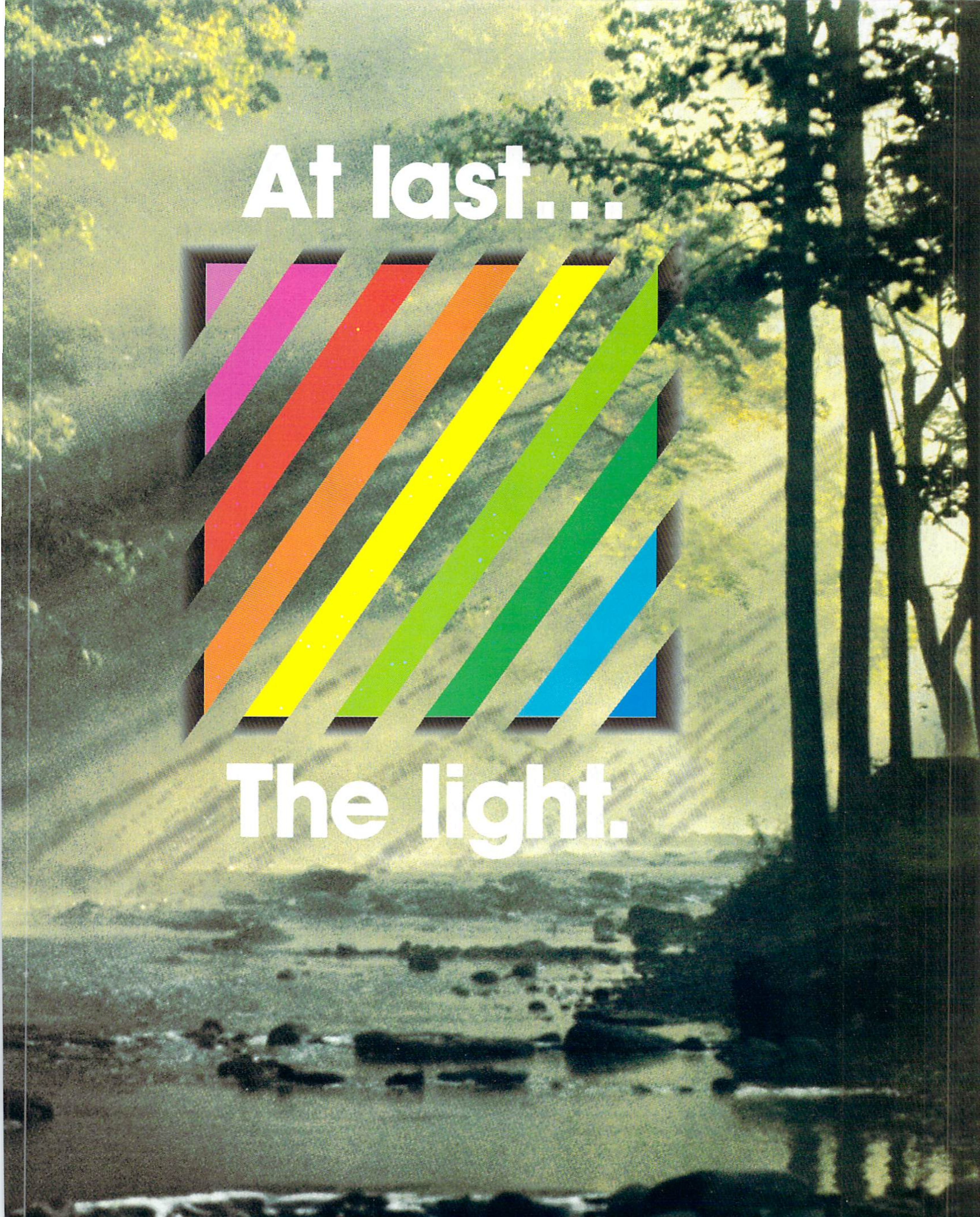


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*Available October, 1986

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At last...
The light.

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Heather Paquette
1-800-441-4403
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Giorgio Saluti, manager
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3350 W. Bayshore Road, Suite 201
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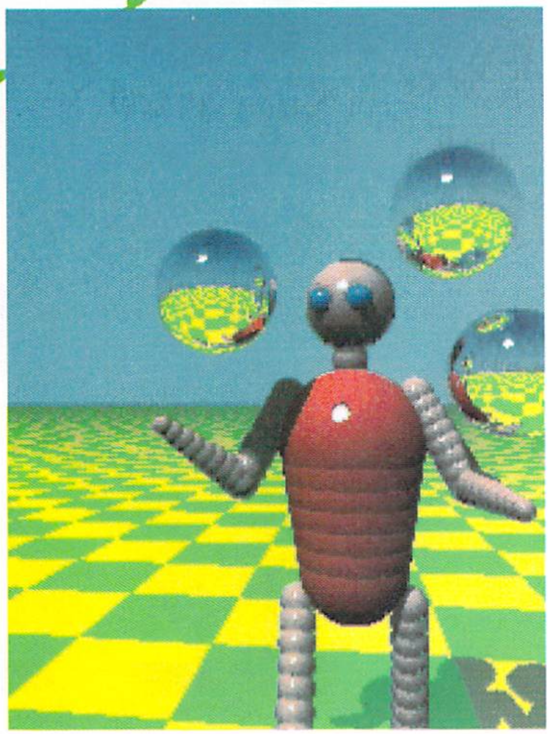
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COVER ART BY ERIC GRAHAM
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MAY/JUNE 1987

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Zeitgeist

Quasi-lucid excogitation from the person posing as Editor-in-Chief.

By Guy Wright

There's ANOTHER Amiga! The A500 is right on the heels of the A2000. In this issue we take a look at this new "home version" of the computer that we all know and love. Why didn't we put a picture of the new 500 on the cover the way we did with the 2000? Well, the 500 is a lot like the 1000, only redesigned and less expensive, while the 2000 had some major new features and changes. And besides, we had that great illustration by Eric Graham all ready to go.

The cover story illustration wasn't done with a paint program—it was done mathematically with a technique known as ray tracing. Each object (spheres are the most commonly used objects in this illustration) has coordinates in 3-D space, color, reflectivity, size, etc., and to generate the picture, the artist inputs data telling the program where the light source is coming from and where the "camera" is positioned. To show the same image from behind and to the left of the juggler, the artist simply inputs new camera coordinates, and the entire picture is then redrawn from the new angle.

If you like the cover illustration on paper, just wait until you see it animated! When the Amiga first came out, the now-famous bouncing ball was a graphic image that no one had ever seen done on a microcomputer. Everybody was impressed the first time they saw it. Since then, other computer manufacturers have been showing bouncing red-checked balls on their machines, "proving" that their computers are as powerful as the Amiga (although I defy any of them to display a bouncing ball on the screen, slide the screen down, open a few windows and run another program or three, all while the ball keeps bouncing along echoing its sampled sounds in stereo). I have seen bouncing balls on Radio Shack Color Computers, C-64s, Apples, and even Ataris (can you imagine that?). Let's just see how long it takes them all to get 3-D, hold-and-modify figures and revolving mirrored spheres running on their machines. By the time the other computers catch up, the Amiga is two steps ahead. And when you see some of the stuff that Aegis has done with their soon-to-be-released animation package, Videoscape 3D, you will be blown away. Check What's New? for more on that.

In this issue we are stepping up the pace a bit. We have expanded the Reviews section for two reasons. First, it is one of the most popular columns in the magazine and second, because the software has been piling up around here faster than we can play...er, uh...review it all. So we decided to clear the shelves and pack as many reviews of software, old and new, into a giant section that I know you will find useful. Unfortunately, there were two problems with this idea. It turned out that even with an expanded section we couldn't get everything in, so I guess we will just have to keep doing more pages of reviews until we have caught up. The other problem was that since everyone on the staff was assigned a bunch of games...er, uh...software packages to review, things got a little weird around the office for a while. (I can hear you all muttering with more than a hint of sarcasm in your voices "Weird? The *AmigaWorld* offices weird? How could that be? Aren't they all 50 years old? Don't they wear ties and brown shoes and look like Perry White, Editor of the *Daily Planet*?") So, a lot of aliens, dragons and heroes lost their lives (and Linda Barrett, our Review Editor, nearly lost her mind) bringing you this section. Hope you like it.

Another thing that we are starting up in this issue is a special column dedicated to the Amiga Community (that's you) written by Peggy Herrington, our special Amiga lifestyles reporter in Albuquerque. She wanted a good excuse to get out of the desert every once in a while and now she has one (actually she would have settled for ANY excuse, but this happens to be a good one). She'll be keeping us all informed about what is going on in the Amiga community: user group activities, BBSs, shows and that sort of thing, so if you have a BBS or are putting on an Amiga show, or your user group does wonderful (or bizarre) things, then let us know and we will pass the word along to Peggy. We are pretty sure that you will like the column, but let us know either way. (If you don't like it, then tell us what you would like to see covered; if you do like it, then Peggy will be able to pay her rent for a while.)

Which brings up another thing. We really appreciate getting the club newsletters that some of you have been sending us. They help us a great deal. We can get a sense of what you are doing, what is important to you and how you feel about various things. A number of our leads for stories have come from your newsletters. If your club has a newsletter, put us on your mailing list. I'll send you something wonderful in return, like an autographed copy of Kickstart version 27.8, or a pair of *AmigaWorld* socks, or a surprise visit, or something.

While we're on the subject of clubs, we are thinking about establishing a national public domain software library available to everyone. User group libraries, BBSs and PD software places have a lot to offer, and we thought it would be nice to start putting together the largest public domain Amiga-specific software library in the world, where just about every program ►

available could be found in one place.

A few of us editorial types managed to convince the powers that be that this would be a wonderful thing, that it wouldn't cost us too much, and that it would be great PR for the magazine. All the while we were thinking about all those programs out there. If some user groups have Amiga libraries of a few hundred PD programs, then we should be able to put together a library with thousands! If some people (or even one person) wanted to start a user group library, they could just send to one place for the disks. Instant library! We got the approval and the budget, so now all we need are the programs. If you or your user group has public domain programs that you would like to contribute, send them to *AmigaWorld* PD Library, 80 Elm St., Peterborough, NH 03458. Even if we get only a few groups willing to share their libraries, we should have plenty to get started. Please, don't send us copyrighted, protection-broken, commercial software or programs that you wouldn't want to share with a few thousand Amiga fans. Also, the more documentation the better. We are going to have enough headaches cleaning up disks, sorting out programs, checking everything, etc. before we open the doors to the public. So send us your Amiga PD software, whether it's a library or just a single program, and before long there should be an absolutely incredible collection to benefit all Amiga owners.

There are just a few more things to mention. Next month we are publishing our first Special Issue—the *AmigaWorld Reference Guide.* Stuffed with all sorts of wonderful things for the novice programmer and the expert, the curious and the fanatic, the beginner and the veteran. Charts and tables and figures and diagrams, page after page of hints and tips (the best of the past and a whole slew of new ones), articles never before published (on this planet anyway), including a positively super-deluxe handy dandy 16-page, pull-out reference guide that you can chain to your Amiga by day and hide under your mattress at night. As they say in the commercials, "it's sure to be a collector's item, so send for it now."

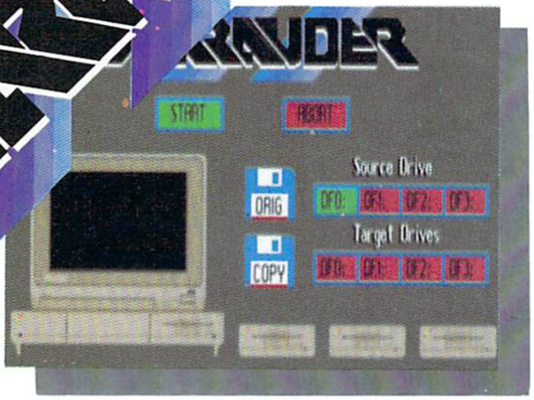
And on a completely different note, we are offering a new research service called Searchlink, and I am very curious about your reactions to it. It isn't like other BBSs, so read the ad carefully. It is a research tool, or gateway service, that gives you access to hundreds of electronic databases around the country without requiring you to know all the passwords and protocols or be a subscriber to each one. You call up, request information about any number of things, and Searchlink then decides which database you need, calls them right then, and you can access the information directly. At the moment, there aren't that many databases out there catering to the Amiga, so don't be disappointed if you can't find information about Workbench 1.2 or Mindwalker. The service isn't cheap either, so if you just want to browse, it might be better to head for your local bookstore or library. But if you are doing research for business or school, then you should be able to save some time by using Searchlink. Either way, I want to know your reactions.

I'm sure I have forgotten something, but I've already been rambling on for too long. The new Amiga 500, incredible graphics in our cover story, *AmigaWorld* PD Library, expanded Reviews section, *AmigaWorld* Special Issue, our new Amiga community column, Searchlink....Yes, that seems to be enough for now. Is it my imagination or has there been a lot going on these days?

Anyway, onward!■

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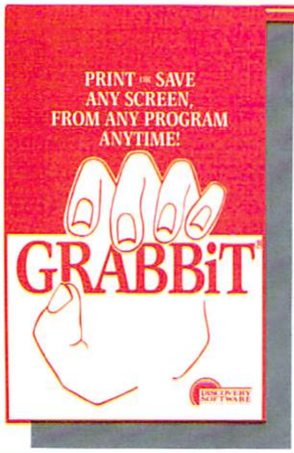
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With GRABBIT you can capture exactly what you see on your screen in an instant, regardless of what programs you're running. GRABBIT works with all video modes, including "Hold and Modify." What's more, GRABBIT runs completely in the background, transparent to your other software. GRABBIT is always ready for you to use, even when you're in the middle of another program. As if that is not enough, GRABBIT requires only about 10K RAM to operate, and it supports dozens of printers. GRABBIT is truly a productivity power tool for your AMIGA!

GRABBIT is far superior to other screen-printing "programs" because of its small size and quick performance. No complicated setup is required, just install and go! Also, GRABBIT doesn't require the screen to remain visible during printing or saving, and stopping the print operation is as easy as starting it.

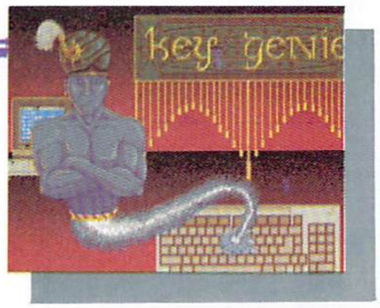
GRABBIT supports all standard Amiga printer drivers. GRABBIT also supports full color printing.

In addition to GRABBIT's printing capabilities, the package also includes a powerful utility program "ANYTIME." The ANYTIME bonus program is a "Preferences" style palette requester that allows you to change any colors of any screen, anytime! With ANYTIME, you are NOW capable of customizing all colors to match your printer's hardcopy to the screen's colors.

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Repartee

Zeitgeist-Kultur

Why don't you use something other than Hegel's "Zeitgeist" for the title of your editorial column? Yes, it's German, all right. But it's not a new idea—it's an old idea originated by Hegel, and taken up by all sorts of the usual Deutsches-Volk types of philosophers of the nineteenth century, such as General Friedrich von Bernhardi and Heinrich von Treitschke. A symbol of this "Zeitgeist-Kultur" was Kaiser Wilhelm II. Very German.

Hegel felt that every historical epoch is dominated by a "Zeitgeist" (spirit of the time). He also felt that the Zeitgeist of the nineteenth century was the German civilization, whose greatest contribution was "freedom" through strictly disciplined order. Hegel exalted the state. "Only in following the tenets of Authority and the State, can the individual find meaning and inner freedom." Typically German, don't you think?

I think you should ask Belgians from Louvain what they think of Germany's new "spirit of the times." Belgians probably know more about the Germanic Zeitgeist than any other Western Europeans. They declined to follow Hegel's "tenets of Authority and the State." And look what happened. Things typically Germanic followed. Look into Barbara Tuchmann's The Guns of August, *specifically the chapter entitled "The Flames of Louvain," for a quick overview of Germanic cultural behavior.*

I would hope that most Americans would not want to have even a symbolic connection with the Zeitgeist idea of Der Deutsches Schrecklichkeit-Kultur. Also, very German.

Dale Stupfel
Dublin, CA

The selection of the word Zeitgeist as the title for my editorial page was not intended to be a sanction of atrocities carried out in the Second World War, and I doubt that very many people, including Belgians from Louvain, are offended. Zeitgeist is a very good word for which there is no English counterpart, and it describes my intentions for the editorial page exactly. Connecting Hegel to WWII is like connecting Jesus to the Spanish Inquisition. Simply because something has German origins is no reason to make associations with one dark period of history; to do so, one denigrates an entire nation. Philosophies, ideologies and religions always have been and always will be used as justifications and rationalizations for genocide. If some people are offended by my use of the word Zeitgeist, I feel sorry for them. I will not apologize, just as I would not apologize to someone who was offended at the presence of a Jew or Black or Belgian in a restaurant.

Guy Wright
Editor

Dingle-Dongle Blues

Until I bought Superbase [Progressive Peripherals and Software Inc.], I had never heard of a "dongle." We have two Amigas in this house. We also have two pairs of bifocals and have never felt dishonest about buying one copy of a book that we both want to read. We don't trade or give away copyrighted software.

If I want to use Superbase, I have to go upstairs, usually, to get the dongle. If my husband wants it, it's likely to be at my computer. If someone should want to use the gameport where the dongle is, it has to be removed. The dongle could get lost, along with all the data stored on the disks. I have no idea what one would have to go through to be issued a replacement dongle. I think of an FBI investigation. According to the manual, the Superbase dongle doesn't interchange with that of Logistix, another program from Progressive Peripherals. One could soon have a box full of dongles and a chronic case of the dingle-dongle blues.

If I had known what I know now, I'd have shipped Superbase back without opening it, because I consider the dongle to be the silliest insult yet to the purchasers of a product. Superbase is a fine program with which I have no other complaints, but I wouldn't buy another product from any company that makes the user so vulnerable to accidental loss.

Margaret J. Little
Morgantown, WV

Another Angle

I don't buy copy-protected software because all too often I have watched such programs self-destruct; computers do what they want to do and when they want to do it. Nor do I have any use for software crooks; a man deserves to be paid for his work.

But there is another angle to this dilemma. The other day I went into a store and bought a copy of Chessmaster 2000 [Electronic Arts]. It comes in a sealed package, and the only information you have is what is printed on the outside. When you get home with it, you find that the package contains one disk with a note that tells you the program is copy-protected, and if you want another copy, you can get it by mail for an additional five dollars.

Is this fair? Why not print this information on the outside in the form of a warning?

Larry T. Killen
San Angelo, TX

Sounds like a good idea to us. And the warning should be printed in large type, right Larry?

—Editors

Amiga Desktop Publishing

How about a feature on desktop publishing with the Amiga? So far there are at least three publishing programs available for the Amiga: Freelance from VIP Technologies, Publisher from Northeast Software Group and PageSetter from Gold Disk. In addition, there are various related utilities, including font programs, LaserWriter interface, etc.

Desktop publishing is the fastest growing field in home computing, and one for which the Amiga is uniquely suited. We think of the Amiga in terms of graphics and video applications, while tending to gloss over her other attributes. Let's show everyone that the Amiga can outpublish the Mac!

Richard J. Norgard
APO, New York

The Amiga does have great potential in the area of desktop publishing, but to say that it can outpublish the Mac is a bit premature. As of this writing, Gold Disk's PageSetter is the only Amiga desktop-publishing package we have seen in a completed version. (See our review of PageSetter on p. 66.) Freelance and Publisher may or may not be available by the time you read this. We agree that desktop publishing with the Amiga deserves coverage, and we will be devoting more attention to it (in the form of articles and product reviews) as the field grows.

—Editors

Send your letters to: Repartee, *AmigaWorld* editorial, 80 Elm St., Peterborough, NH 03458. Letters may be edited for space and clarity.■

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Hors d'oeuvres

Hints and tips have been flowing like hollandaise sauce around here. This issue we have an international menu to tempt your palette.

If you've cooked up a tasty morsel that you would like to send in, then by all means do so! In exchange for your contribution (if it gets published) you will get a highly coveted AmigaWorld *T-shirt worth tens of thousands of dollars on the open market (if you can find someone willing to pay that much). You get global recognition, other readers reap the benefits of your knowledge, and we keep the tip. So send your contributions to:* AmigaWorld, *Hors d'oeuvres, 80 Elm St., Peterborough, NH 03458.*

For those of you just sampling these tidbits, we don't guarantee anything. We try to make sure that the tips are accurate and do what they are supposed to do, but every now and then something half-baked slips past our testers. So. . .beware. If you do find something wrong with one of the hints, then let us know so that we can warn others.

Video Flashback

In our January/February '87 issue we published a tip about using a C-64 video cable to clean up the Amiga signals for better video images. We received a lot of calls and letters about this suggestion, and after talking to a Commodore engineer or two, we pieced together something of an explanation. It seems that the video signals coming from the Amiga are a little too hot for some VCRs and monitors. The Amiga monitor handles the signal just fine. The C-64 cable, which separates the signal into chroma and luma, simply lowers the video signal and acts as a comb filter. The Amiga signal doesn't get split into chroma and luma like a C-64; it is simply reduced to a level that the VCR or monitor can handle.

The problem with purchasing a C-64 cable is that currently at least three variations on the C-64 video cable are manufactured by third parties, and short of testing with a VU meter, there is no way to tell them apart. Even if you do find the right cable, your picture won't necessarily be improved. Your VCR or monitor may not be as sensitive to the hot Amiga signal as someone else's, so you may already be getting the best signal possible.

The only way around these problems without wasting money is to find someone who bought a C-64 cable that *did* clean up their picture, borrow their cable and try it on your system. If it works, then find out where they bought their cable and go get one for yourself.

The story on Amiga video is not complete, so if any of you readers are TV or video experts with access to oscilloscopes, vectorscopes, waveform monitors and all that other video-tech stuff, check it out for the rest of us and let us know what exactly is going on. Is the Amiga signal too hot? Does the C-64 cable trick work? Why? Could you just buy a comb filter from Radio Shack and improve the picture? Are there other tricks or attachments that might improve the video out?

—Editors

More Space on Disks

One way to make more space on disks is to delete the files that are not needed in the SYS:DEVS/PRINTERS directory. If you use one of the printer drivers provided by Preferences, you simply delete the others. Let's say you want to keep the Generic printer driver and delete the rest. Just enter the following from the CLI prompt:

```
CD DEVS
COPY PRINTERS/GENERIC TO SYS:T
CD :
DELETE SYS:DEVS/PRINTERS ALL
CD DEVS
MAKEDIR PRINTERS
COPY SYS:T/GENERIC TO PRINTERS
CD :
```

It is a good idea to do a DIR DEVS/PRINTERS before deleting printer files just to see how they list your printer (type it exactly as they do) and, as always, *don't do this on your original Workbench disk!* What if you buy a new printer someday?

Schmid Eric
Varberg, Sweden

Reading Joysticks in C

For my latest C language project, I needed a way to read the joystick ports. The manuals propose a very complicated procedure, so I developed my own. In my routine, I step down into the machine and read the hardware registers directly. Here is a short routine that should run on both Aztec and Lattice compilers:

```
#define PORT 2
short *joy = 0xdff008 + 2 * port;
char *cia = 0xbfe001;

main() {
  for(;;) {
    if (*joy & 2)
      printf("RIGHT ...");
    if (*joy & 512)
      printf("LEFT ...");
    if ((*joy >> 1 ^ *joy) & 1)
      printf("DOWN ...");
    if ((*joy >> 1 ^ *joy) & 256)
      printf("UP ...");
    if (!(*cia & 64 * PORT))
      printf("FIRE !!!");
    printf("\n");
    }
}
```

Martin Brenner
Neu-Ulm, West Germany ►

Auto Alternate Character Reset

If you spend a lot of time using the CLI, then sooner or later you will find yourself typing gibberish when you get switched to the alternate character set. The quick way to switch back and forth is CTRL-L (hold down CTRL key and press L at the same time) to enable alternate set and CTRL-O (the letter O, not zero) to get back to the normal character set. The following tip will save some time by automatically issuing a CTRL-O every time the CLI prompt (1>) appears.

From the CLI, type the following sequence: PROMPT "CTRL-O%N> " then press Return. The CTRL-O will not appear on the line but will be entered into the new PROMPT sequence. In other words, type the word PROMPT, space, quote, hold down the CTRL key and press the O key, percent, N key, > key, space, quote and Return key. The PROMPT command changes the CLI prompt to anything you want; the %N is interpreted by the CLI as the current process number, so if you leave it out your prompt will just be a ">".

This change cannot be made permanent, but it can be entered as part of the startup-sequence.

David Morgan
Robina, Australia

Custom CLI Modes

From the CLI you can enable the various text modes with a few short keystrokes. The sequence is simply:

ESC[*n*1;*n*2;*n*3m

where ESC is the escape key, *n*1 is a number for style, *n*2 is a number for foreground color, *n*3 is a number for background color, and m is the sequence terminator. The following is a list of values you can use, but be aware that if the colors have been changed through Preferences, these numbers will give different results.

STYLE
- 0 = Plain Text
- 1 = Bold Face
- 3 = Italic
- 4 = Underline
- 7 = Inverse

FOREGROUND
- 30 = Default
- 31 = White
- 32 = Binary complement color (black for the Workbench default colors)
- 33 = Red

BACKGROUND
- 40 = Default
- 41 = White
- 42 = Binary complement color
- 43 = Red

You can also combine styles by entering each style number separated by a semicolon. For example

ESC[1;33;41m

will give boldface red on white, and

ESC[1;3;4;31m

will give boldface underlined italics in white.

Some of you will notice that these are the same escape sequences used by the printer.device. The September/October 1986 *AmigaWorld* Help Key has a complete list of the printer sequences, and since the CON: is treated pretty much the same way as the PRT:, some of these sequences work on the screen as well as on paper.

Aside from being just fun, there are some practical uses for these customizing techniques. You can include these escape sequences as part of your file comments. I use them in commenting my directory names (which I like to keep as short as possible to avoide extra typing). When you list your files, you can make the ones you chose stand out from the others. For example:

FILENOTE *filename* COMMENT
"this file is ESC[1m IMPORTANT!
ESC[0m"

prints the word IMPORTANT in boldface when listed. Filenote is the DOS command to append comments to a file. Since we're entering escape sequences and spaces in our comment, we need the quotes. It is also important to change the text back to normal at the end with ESC[0m or everything listed after that will have the same style and color.

Jim Davis
Niles, IL

Custom Prompts and Echoes

Both the PROMPT and ECHO commands found in the C directory can be modified to issue some of the ANSI command characters in order to change the displayed text both in color and style. By using the same techniques mentioned above, you can add color to the 1> CLI prompt or anything "echoed" to the screen.

To tell PROMPT or ECHO to accept the codes, a template of commands is used. This template is:

CSIstyle;foreground;
*background*m

CSI is Control Sequence Introducer, which can be ESC [or in hex 1B 5B; for the PROMPT and ECHO commands, it is *e. The style and color options are listed above. These colors will be different if changed through Preferences. The m at the end is the Command sequence terminator. Once the PROMPT and ECHO commands have been modified, they stay that way until you either change them again or re-boot the system. To modify the prompt, try something like: PROMPT "*e[3;33;41mAmigaWorld> *e[0m". You should get an italic *AmigaWorld*> in red on a white background prompt with everything you type after it in normal white on default blue. To modify the ECHO command, try something like: ECHO "*e[4;32mHello There *e[0m". You should get the underlined words "Hello There" printed in black.

David Morgan
Robina, Australia

Changing Disks With One Drive

When using AmigaDOS and only one drive, things don't always work the way you might want them to. Especially when you have to replace the Workbench disk in the drive to load the command. Some AmigaDOS commands execute immediately once they are loaded, not giving you the chance to put the non-Workbench disk you wanted to work on back in the drive. Using the CD command doesn't work because, once loaded from the Workbench disk, it is executed instantly.

I found a way around this that people may not have discovered. When issuing one of those instant execution commands, I just add a space and question mark before pressing return, which results in the AmigaDOS version of on-line help. This will give you the syntax and format of any AmigaDOS command (a nice thing to remember for beginners) and also loads the command into memory before executing. This technique works with any of the AmigaDOS commands even if they don't have parameters, like the INFO command. Just type INFO ? and after the disk swap the message none: will appear. Replace the disk ►

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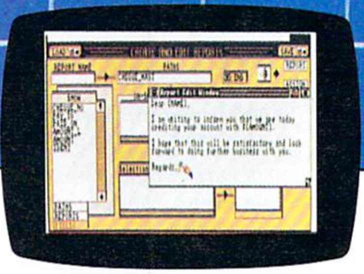
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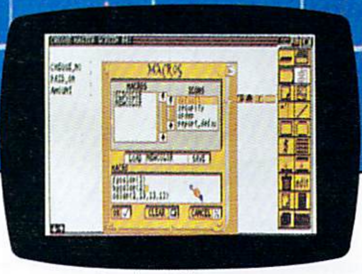
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you want info on and press return.

I hope this makes things a bit easier for all of those other single-drivers like me.

Shawn Switenky
Prince Albert, Saskatchewan, Canada

DeluxePaint Keyboard Colors

I use DeluxePaint frequently, and over the months I have stumbled upon a couple of undocumented keyboard color commands.

The 7 and 8 keys (on either the main keyboard or the keypad) subtract and add to the level of red in the currently selected foreground color. The 4 and 5 keys work the same way for green. The 1 and 2 keys work for blue. These are the keyboard equivalents of the RGB sliders on the graphic palette. Note that these keys are not subject to the limitations of the graphic palette involving colors 1 and 2. (See the manual and below for details.)

Pressing the Help key will set color 1 to black and color 2 to white. These colors are used by DPaint to draw the menus, and loading a picture made with another program may make their values too close, rendering the icons and title bar invisible.

Finally, the braces { and } (shifted bracket keys) allow you to step through the palette to select the background color in the same way the bracket keys [and] (unshifted) allow you to select the foreground color.

Bryan Costin
Woodbine, MD

DeluxePaint Hidden Area Undo

When painting in the areas of the screen that would normally be hidden by the menu bars (on the top and right), you cannot use the UNDO option to correct mistakes (perhaps because re-enabling the menu bar is considered selecting something new). One way around this is to use the Center Picture option. Just move the cursor to the right side or the top of the screen and press the N key, which automatically scrolls your picture so that areas hidden under the menu bars are now uncovered. Now you can work on them without toggling back and forth with the F9 and F10 keys.

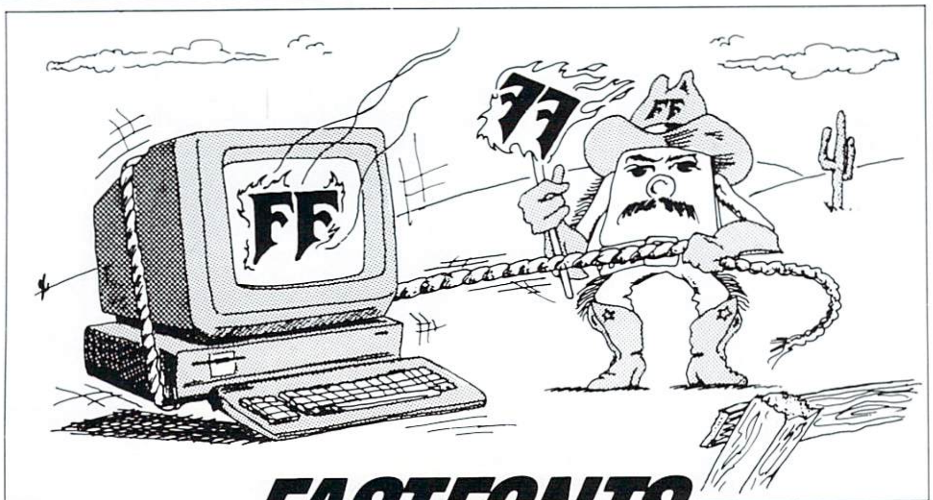
Roger Goode
East Elsewhere, Dimension 47

Startup Speedup

I would like to share a nifty little trick that will speed the startup-sequence on your Workbench disks. Most startup-sequences contain a number of ECHO statements that display bits of information and instructions. Each time the ECHO statement is encountered, it must be loaded from disk. This slows down execution time significantly. The statement ADDBUFFERS DF0: 15 as the first statement in your startup-sequence will eliminate this slowdown. The statement creates a sort of mini-RAM disk that stores the last disk access (or as much of it as will fit) for instant recall. You don't want to allocate too much RAM because once allocated, there is no way (that I know of) to get the RAM back. You can use this trick to allocate RAM storage for any drive by changing drive numbers in the ADDBUFFERS command. However, this command is only available under AmigaDOS 1.2.

I have also found that a foam place mat from the dinner table makes an excellent and inexpensive mouse pad.

R.D. Thomas
Millington, TN ■



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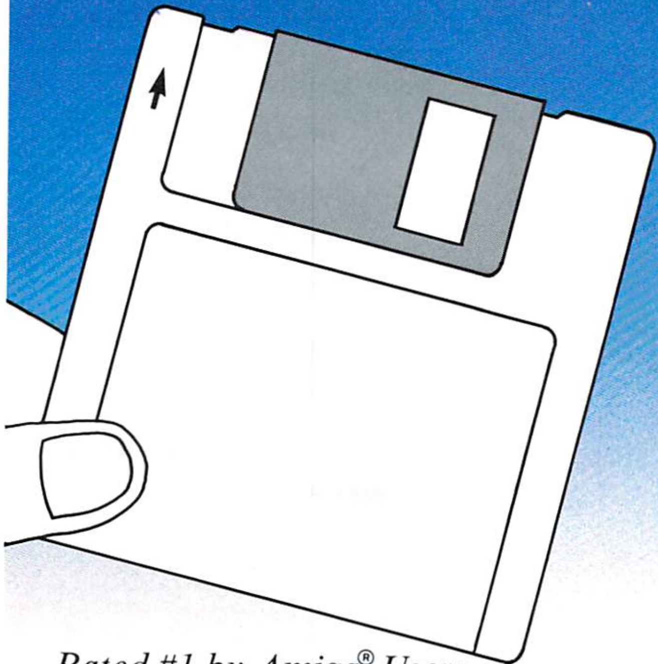
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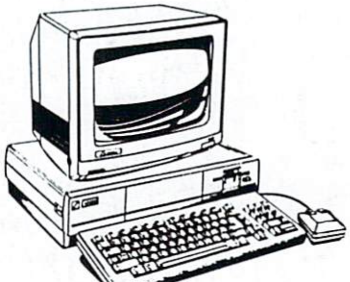
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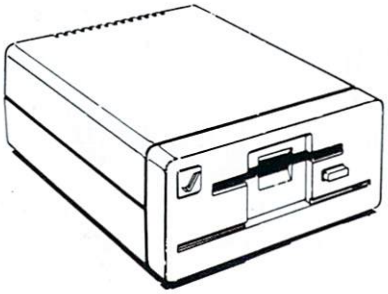
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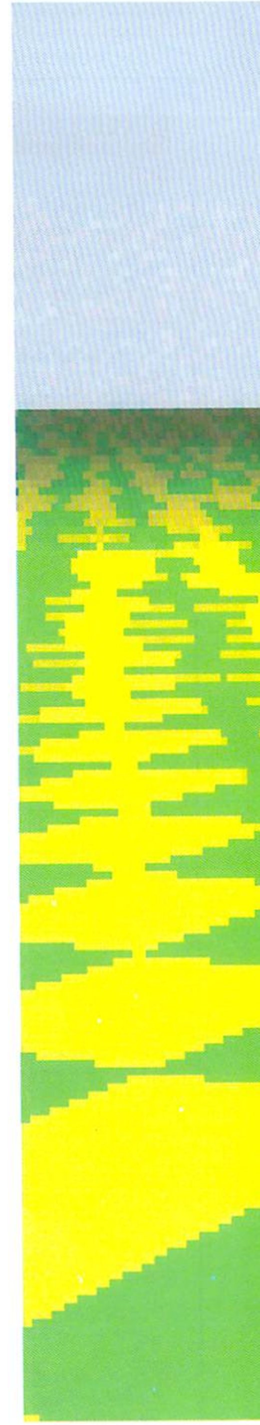
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Graphic Scene Simulations

Amiga graphics so realistic they seem to transcend reality, conjuring a vivid surrealistic world.

By Eric Graham



The robot juggler. All aspects of this HAM image were "automatically" created with a ray-tracing program.

BEHOLD THE ROBOT juggling silver spheres. He stands firmly on the landscape and gleams in the light. He is only a microchip phantom, yet he casts a shadow. You can see his reflection in the refined orbs he so deftly tosses. He inhabits space, in a pristine computer's dreamscape. Though he looks strangely real, he exists only in the memory of the Amiga.

This colorful automaton is not your everyday computer graphics robot. He wasn't carefully rendered with a paint program, nor was his image captured by a video frame grabber from a picture or a model. He and his surrealistic world were "automatically" created with a C program. In this article, I will describe how these graphic simulations are created through a technique called *Ray Tracing*.

A ray-tracing program, written in C and named *Graphic Scene Simulation*, accompanies this article. These images require a hold-and-modify (HAM) display. Because of space limitations, my listing doesn't include the routines for producing a hold-and-modify screen. However, my routines do form the logical core of a ray-tracing application. The procedure for creating the routines necessary for setting up and releasing HAM screens can be found in Addison-Wesley's *Amiga ROM Kernel Reference Manuals*. For those of you uninitiated into C (or who just don't care to program), details will be given at the end of this article about obtaining the program on disk with the executable code, and information on inputting data to create scenes of your own.

Gaining Perspective

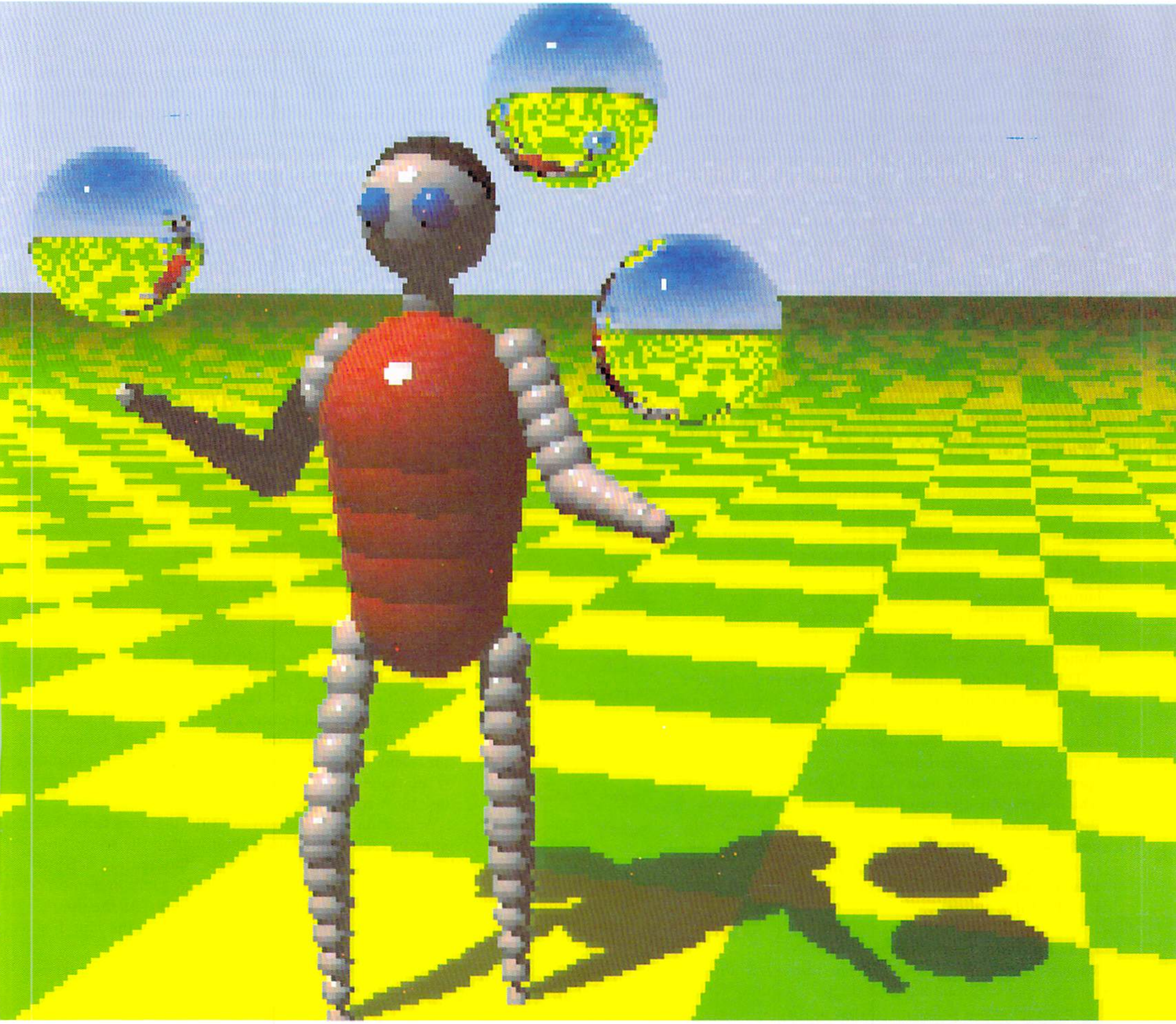
Computer images are usually made up of two-dimensional shapes. In the Amiga's case, these shapes are filled with color. As in any two-dimensional artform, if the shapes are combined in the right way, the result can give the appearance of a third dimension—one inhabited by solid objects. To say it in reverse: Three-dimensional computer images can be broken down into two-dimensional shapes (i.e., the pieces that make up the whole). The final product, the three-dimensional image, has the look of substance, volume, depth, reality. The whole, as it were, becomes greater than the sum of its parts.

Highly sophisticated computer graphic simulations go beyond this and attempt to replace the often cartoon-like computer image with one containing all the nuances of color and shading that we see in the real world. Such graphic simulations are now commonplace; you see them before TV network news programs, movies and sports events, and as station logos. Graphic simulations have also been used in many movies, such as *Tron* and *The Last Starfighter*.

Although many simulations employ supercomputers like the Cray XMP and high-powered (and expensive) graphic displays, you can use your Amiga to experiment with sophisticated graphic simulations. The Amiga is unique among modestly priced computers in that it provides the ability to display many colors and shades of brightness. Using the hold-and-modify (HAM) mode, you can use up to 4,096 colors and shades on the screen at the same time. The Amiga, as you can see in the images I have created, is very capable of producing subtle graphic simulations.

An Alternate Reality

When you perform a graphic simulation, you are given a rare opportunity to in some ways design your own universe. You obviously have such mundane choices as what colors to use for the ground and the sky (if you even want a ground or sky), but you can also choose



your own laws of physics.

Because you are trying to make a visual rendering, you must decide how light is to behave in your world. Does it travel in straight lines or in curves? How does it reflect off different objects? You must also populate your universe with objects. Finally you must place an "observer" in the universe, for it is the observer's view that you wish to display on your computer screen.

The Robot's Universe

Our robot's universe is particularly simple. It has a flat ground, checkered like cheap vinyl flooring, that stretches off into infinity. It has a sky that changes from one color directly overhead, to another color at the horizon. (Being a traditionalist, I chose shades of blue, but you can choose any two colors you wish.)

The universe requires one discrete place from which to make all measurements. (Mathematicians call such a place an origin.) The objects in this universe are all the same shape; they are spheres. Each sphere has a position, a radius, a color and a surface finish. (Spheres have one very nice property: you do not have to specify ▶

their orientation. Rotate a plain sphere and you cannot see the difference.) The position of each sphere is specified by its coordinates, which are a set of three numbers. If you wish, you can regard the first of these numbers as how far the center of the sphere is to the north of the origin. The second number specifies how far the sphere is to the west of the origin; the last number measures how far the sphere is above the origin.

The color of a sphere is represented by a set of three numbers also, representing the fraction of red, green or blue light that is reflected from its surface. Exactly how light is reflected from the sphere depends upon what the surface of the sphere is like. In this universe there are only three possibilities to consider: First, the surface can be dull, in which case light scatters in every direction; second, the surface finish can be shiny, with most of the reflected light being scattered, but a little being reflected in one specific direction; finally, the surface can be like a mirror, with no light being scattered and all reflected light going in one direction.

Everything we could possibly want to know about a sphere in this universe can be summarized by eight numbers: three for the position, one for the radius, three for the color and one for the surface type. The Amiga's memory is large enough to hold the information on tens of thousands of spheres, so we could, in principle, build quite a complex universe.

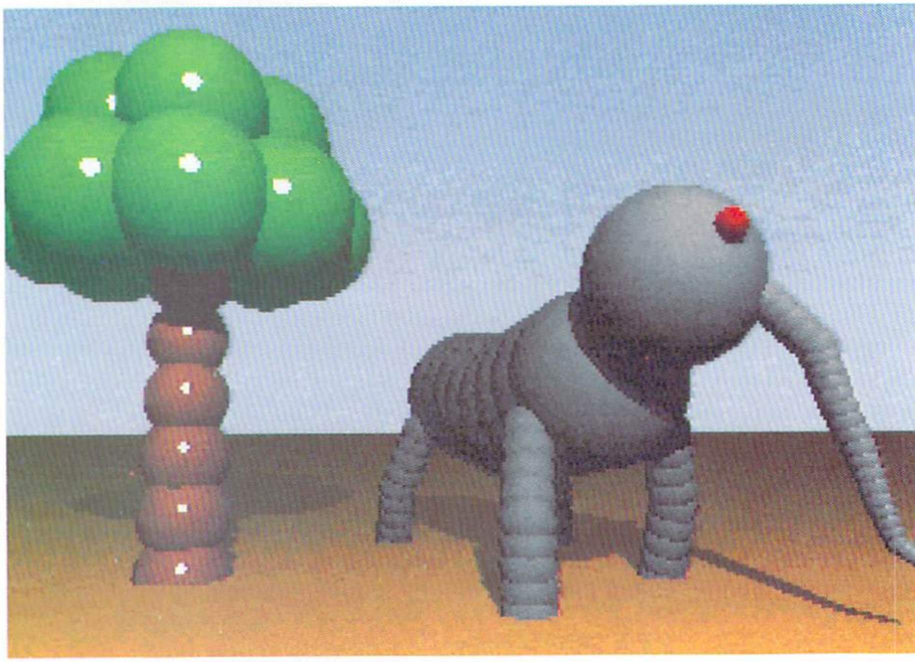
Illumination has been provided by positioning some lamps. The lamps are yet more spheres, but they give out light rather than reflect it. To soften the shadows, we have provided ambient lighting: diffused light that comes from all directions.

The last element specified is the "observer." Perhaps it is better to think of the observer as a camera. We will try to calculate what light would enter the lens of the camera, and so be able to display on the screen of our computer what picture the camera might take. We must specify where the camera is located (three numbers), in which direction it is pointing (two numbers, one for the number of degrees it is pointing away from north, and one for how many degrees it is pointing above or below the horizon), and finally how wide the camera's view is—what photographers describe as the focal length of the camera lens.

How to Generate a Picture

We have condensed an entire scene into a few numbers, so that it can be handled by the computer. Now we must go about calculating what to display on the screen. We have two ways of solving the problem. The first is called *Boundary Representation*, or B-rep by the experts. This involves considering where the apparent boundary of each object would lie on the screen and then filling in the part of the screen inside the boundary with the appropriate color. This is particularly easy on the Amiga because the system software will handle area filling. Unfortunately, boundary representation has a couple of drawbacks. The color within a border varies due to shading and reflections, so a simple area fill will not suffice for realistic scenes. The second problem is that parts of one object may be hidden by another object, so determining which parts are visible may be complicated.

The other way of generating scenes is called *Ray Tracing*. It is conceptually very simple: Imagine that you are in the position of the observer. You take a glass plate, scribed with a grid of lines that creates squares that match the pixel positions on the screen, and hold it up in front of you. The color that you see through one



An imaginary pachyderm stands by an exotic tree. The landscapes in all these images stretch back to infinity.

square of the plate is just the color that you need to display on the screen at the corresponding pixel location. Follow the light ray backward, from your eye, through the glass plate and out into the world. Once we find the first thing that this backward ray strikes, we can calculate the brightness of the object at that point by multiplying the color of the object by the light that the object receives.

We calculate the light by considering lines from the point to each of the lamps illuminating the scene. So long as nothing blocks a line, the illumination depends upon the brightness and color of the lamp and upon the distance from the lamp to the point. As the light striking an object becomes more oblique, the illumination per unit area decreases.

The ray-tracing method has a number of advantages, the foremost being that the code itself is much simpler than the code for boundary representation. It automatically handles complications like perspective, reflections, shading and shadows. It makes it easy to add new features, like differently shaped objects and different rules for reflections. Ray tracing's main drawback is that, for simple scenes at least, it is slower than boundary representation.

Hold and Modify

In order to display scene simulations with many hues and subtle shading, more than two or four, or even 16 colors must be available. The Amiga's hold-and-modify (HAM) mode, allowing up to 4,096 colors to be simulta-

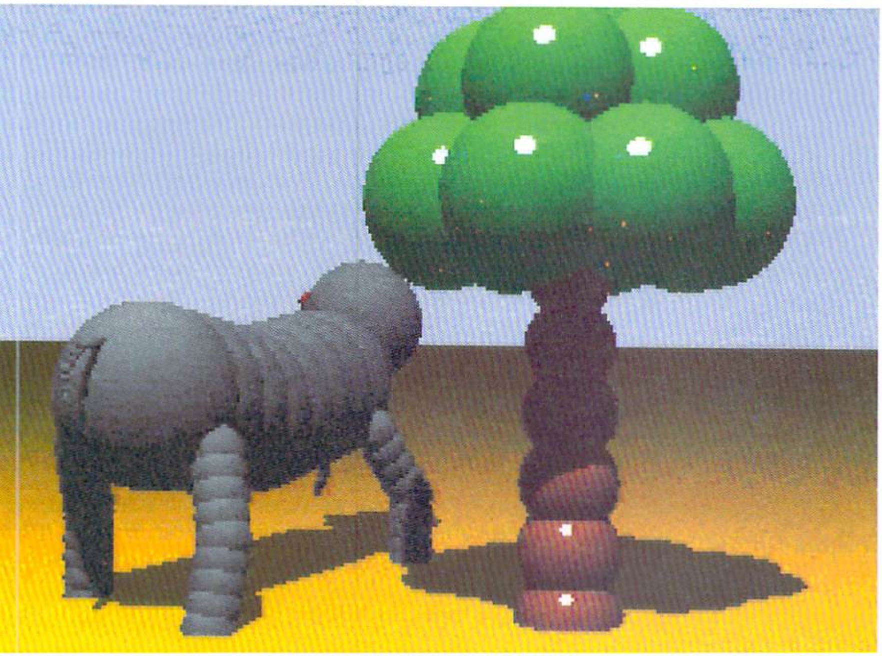
neously displayed, allows great subtlety. Colors are created on the screen by displaying a combination of the primary colors: red, green and blue. (The Amiga permits you to display 16 different levels of each primary color; these combinations produce the 4,096 colors that are possible.)

However, HAM does have one drawback due to the details of the way that it works. When you generate a screen image with HAM, you can't directly specify any color that you want. Instead, you can say how one pixel differs from the preceding one. The catch is that you can only change one color at a time. If you have just displayed an area of black (red = 0, green = 0 and blue = 0) and you want to display white (red = 15, green = 15 and blue = 15), you must, for example, first change the red value, then the green value and finally the blue value. The sequence of pixels will be black, red, yellow and white, rather than a clean transition. Therefore, brightly lit objects against a dark background will have a colored fringe around them, rather like the chromatic aberration that you see in a pair of inexpensive binoculars. The colored fringes, however, can be reduced.

HAM Tweeking

HAM does permit you to specify a color for a pixel directly, so long as it is one of 16 colors that you can select and store in the Amiga's color registers. If you choose these 16 colors wisely, then you can make sharp color transitions more cleanly and the colored fringes are hardly noticeable.

The same pachyderm and tree, but automatically recalculated and displayed from a different viewpoint.



In principle, after you know all the color transitions that your picture requires (up to 64,000 of them), you could make your selection of what to put in the 16 color registers in order to minimize the fringes. That would be a lot of work. You could pick the 16 to span the spectrum of colors without regard for the picture content. What I have done in my program is to employ what is called a heuristic method (i.e., an approach to problem solving whereby updated solutions are found, while a program is runnimg, by continually building on results or feedback). At first I don't use any of my 16 direct colors. When I first encounter a sharp transition, I assign the color value to one of the free registers. As the display progresses, when I encounter another color transition I look to see if the contents of one of the color register values is close enough; if it is, then I use that value rather than use up one of the remaining registers. All you have to do is fine-tune the meaning of "close enough." If you are too picky, you will have used up all your registers early and you won't be able to cleanly handle a color change combination that you encounter at the end of the display.

One other problem that is shared by all raster displays is called aliasing, or more commonly, the "jaggies." This is caused by the finite size of the pixels. The closer a slanted edge is to horizontal, the more the grid of pixels creates a staircase effect. The human eye is expert at spotting these aberrations. Sophisticated anti-aliasing schemes have been devised to recognize the jaggies and then modify the image in their vicinity to make them less apparent. A simpler scheme is to slightly blur the image by mixing the color of each pixel with the colors of its neighbors.

A more subtle problem arises when you have very gradual shading. Since the colors can only change in discrete steps, an effect appears like that on a contour map, with rings of colors painfully evident. The most effective solution is to purchase a computer with a higher resolution display, and with more than 16 levels for each color. For those of us without deep pocketbooks, a simple trick is to slightly randomize the colors so as to break up the regularity of the contours and make them less evident. This gives the final picture a slightly grainy look that is not unpleasant.

Speeding up the Display

On the Amiga, with a resolution of 320 × 200, we have to calculate the brightness of 64,000 pixels. In the ray-tracing method, there is one ray for each pixel. If the scene contains 50 objects, we have to see if the ray intersects an object. If it strikes several objects, we must know which one is the closest to the observer. Then we have to evaluate the brightness at the nearest object. This involves checking to see if another object lies between the first object and each lamp. Each intersection test involves a few dozen floating-point arithmetic operations. Since the Amiga cannot perform floating-point operations directly, each operation must be broken into many simpler operations. The time required to generate a single picture this way could be as long as a month!

Whenever you are faced with the problem of optimizing code to increase speed, you should step back from the details and see what is going on. Obviously a lot of arithmetic is being done here. How can it be made faster? Recasting the equations from floating point to integer form would be possible, but would be extremely unpleasant. A simpler approach would be to replace ▶

the usual Amiga arithmetic routines with the *Motorola Fast Floating Point Package*. (The program I used to generate the pictures with this article differs from the listing printed here in that it has the Motorola routines included.) The Motorola routines are less accurate but run nearly ten times faster. Now our picture only takes a few days to generate.

The next step in optimization is to pretend to be a computer and to follow through each stage of the calculation. The first thing that you will see is that most of the calculations are quite unnecessary. Many rays will not intersect any objects at all. Many raster scan lines will also miss the objects. If you can detect this, then a lot of time can be saved, even though your code gets more complicated.

Putting in these features can speed up the generation of a typical scene by a factor of one hundred. Now we can make a picture in an hour. Doubtless some further improvements are possible, but they would require considerable programming effort. Professional scene simulations on a Cray supercomputer (on a finer raster grid, and with more complicated objects) take several minutes, so we are not doing badly with our Amiga!

The ray-tracing method permits one further trick. Suppose we generate a small picture, only one quarter of the size of the screen; now we only have to calculate the brightness of a sixteenth of the normal number of pixels. These mini pictures only take a minute or two to generate, and you can use them to make sure that the observer is in the right place and the lamps are at the right brightness.

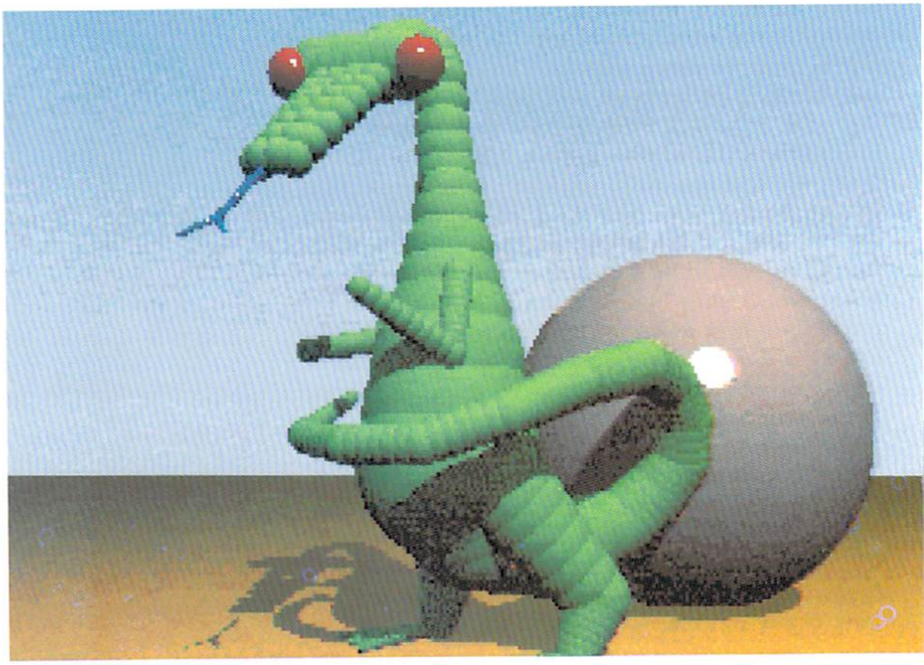
A Ray-Tracing Program

The first part of the accompanying listing, Graphic Scene Simulation, defines the data structures describing the world of spheres. The comments in the code should suffice to explain how it works, but a few remarks about the underlying mathematics may make it more comprehensible. I have used vector arithmetic to handle three-dimensional geometry, so you don't have to be bothered with trigonometry or other complications.

A vector is an object that has both a magnitude and a direction. Think of it as an arrow. It can be pointed in any direction, and the length of the arrow represents its magnitude. A vector can be represented by an array of three numbers, or components. Vectors can be added or subtracted, simply by adding or subtracting their components. In this program, the function *vecsub()* performs vector subtraction.

Vectors are involved in multiplication in three ways. If a vector is multiplied by a number, then each component is multiplied by the number. Two vectors can be multiplied to produce a single number: This is sometimes called a dot product; the function *dot()* performs this operation. A dot product is equal to the products of the magnitudes of the vectors multiplied by the cosine of the angle between the vectors. (As you can see, *dot()* is easier to implement than it is to describe!) One useful result is that the magnitude of a vector, b, is given by *sqrt(dot(b,b))*. Vectors whose magnitude is equal to 1.0 are called unit vectors, and are very useful when you just want to indicate a direction. The vectors *uhat*[] and *vhat*[] are unit vectors that are used to represent the orientation of the screen from the observer's viewpoint.

The third way of multiplying vectors is called a vector product, because the result is also a vector. The function *vecprod()* implements this operation. The result is a vector at right angles to the two vectors being multiplied, with a magnitude equal to the products of the magnitudes and the sine of the angle between the vectors. This is useful in the function *reflect()*, which calculates the direction that a ray takes after being reflected.



A recently-hatched dragon and a dragon egg? As are all the inhabitants of this computed reality, the dragon is made up entirely of spheres.

The rays that we are using are straight lines, but how are these to be represented in a computer? We will use something called the parametric equation of a line. It is really very simple. The coordinates of a point that lies on a line are calculated from seven numbers. Six of them serve to define the line (three to locate the position of the line and three to specify the direction of the line). The seventh number is called the parameter, and it tells you where you are on the line. The array *line*[*6*] is used to represent a line, and the function *genline()* calculates the six components of a line. The function *point()* takes a line and a value for the parameter—I usually call the parameter *t*—and calculates the coordinates of the point on the line.

Another important geometric function is *intsplin()*, which tests to see if a given line hits a particular sphere. Since all the points on the surface of a sphere are the same distance from its center, we only have to see if any point on the line is also that distance from the center of the sphere. Usually the line either misses altogether or hits the sphere twice, once going in and once emerging. Our use of the parametric equation for a line lets us distinguish these cases. We are interested in the intercept closest to the observer, because that is what he sees.

Three other functions are important in the ray-trac- ►



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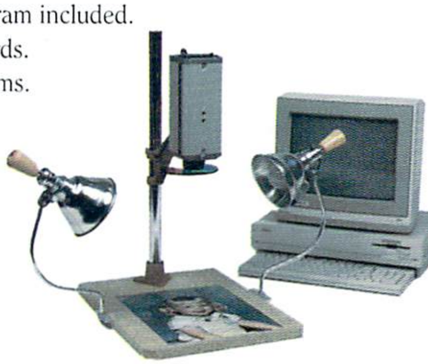
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ing process. The function *pixline()* generates the equation for a line corresponding to a particular pixel on the screen. The function *raytrace()* takes this line and sees where it winds up. The line could intercept a sphere or a lamp, or it could hit the ground. What matters is what the ray hits first, because that is what is seen. If it misses everything, then it must be heading towards the sky, so we just paint the pixel with an appropriate sky color. The last function to be described is *pixbrite()*, which calculates the brightness of a pixel associated with a ray that hits a sphere or hits the ground. We then have to calculate the illumination at that point on the surface of the sphere or the ground.

The function *pixbrite()* checks to see which, if any, lamps are shining on the point because they could be eclipsed by other objects. The illumination depends on the color and brightness of the lamp, upon its distance and on the angle between the lamp and the surface. The remainder of the code adds straightforward detail. For example, *gingham()* calculates the checkerboard pattern of the ground and *skybrite()* calculates the brightness of the sky.

As mentioned earlier, I have omitted the code for setting up and releasing the HAM screen; the procedure is described in the *Amiga ROM Kernel Reference Manuals.* Also, it is up to you to set up the data describing the observer and the objects in your universe.

If you would like a disk containing the complete source code for a ray tracer, *including* the HAM routines, send your name and address to me at the address listed at the end of this article and enclose $15 to cover duplication and shipping charges. The disk contains versions of the source in both C and Amiga Basic. Also included is the version of the program used to generate the images for this article (in case you only want to construct new scenes, rather than get involved with any programming) and an explanation of how you can input your own data into the program.

Future Simulations

The Amiga is a very capable machine for scene simulation; I have only hinted at the possibilities. It would not be difficult to replace the spheres in our example with more complicated objects. Or how about spending a week of your Amiga's time generating a 10-second movie with graphic simulations? Each HAM image takes 48K bytes, so you will need extra memory if you want to construct a long movie. I have been able to compress the images so that even a 512K Amiga can be used to display moving scene simulations. At 30 frames per second, the interplay of moving shapes, shadows and reflections gives an eerie impression of reality, or should I say super-reality—that surrealistic alternate universe that exists within your Amiga.☐

Eric Graham is an ex-astronomer and software developer living in the mountains of New Mexico, surrounded by computers. Write to him at PO Box 579, Sandia Park, NM 87047. Eric's ray-tracing program (with a full Intuition interface) will be available from Byte by Byte this summer.

Listing 1. *Graphic Scene Simulation.*

```
#define BIG 1.0e10
#define SMALL 1.0e-3
#define DULL    0
#define BRIGHT  1
#define MIRROR  2

double dot();    /* Vector dot product */
struct lamp {
    double pos[3];        /* position of lamp */
    double color[3];      /* color of lamp */
    double radius;        /* size of lamp */
};

struct sphere {
    double pos[3];        /* position of sphere */
    double color[3];      /* color of sphere */
    double radius;        /* size of sphere */
    int type;    /* type of surface, DULL, BRIGHT or MIRROR */
};

struct patch {            /* a small bit of something visible */
    double pos[3];        /* position */
    double normal[3];     /* direction 90 degrees to surface */
    double color[3];      /* color of patch */
};

struct world {  /* everything in the universe, except observer */
    int numsp;            /* number of spheres */
    struct sphere *sp;    /* array of spheres */
    int numlmp;           /* number of lamps */
    struct lamp *lmp;     /* array of lamps */
    struct patch horizon[2]; /* alternate squares on the ground */
    double illum[3];      /* background diffuse illumination */
    double skyhor[3];     /* sky color at horizon */
    double skyzen[3];     /* sky color overhead */
};

struct observer {         /* now the observer */
    double obspos[3];     /* his position */
    double viewdir[3];    /* direction he is looking */
    double uhat[3];       /* left to right in view plane */
    double vhat[3];       /* down to up in view plane */
    double fl,px,py;      /* focal length and pixel sizes */
    int nx,ny;            /* number of pixels */
};

main()
{
    double line[6],brite[3];
    struct observer o;  struct world w;
    int i,j,ii,jj,skip; short int si,sj;
```

Listing continued on p. 92.

REFERENCES

Denken, Joseph, *Computer Images: State of the Art* (Stewart, Tabori & Chang, 1983). This book contains more than 250 color images that involve varying degrees of computer intervention.

Sorensen, Peter R., "Simulating Reality with Computer Graphics" (*Byte*, March 1984, pp.106–134). This is an excellent review of professional graphic simulations, including examples and interviews with some of the masters of the craft.

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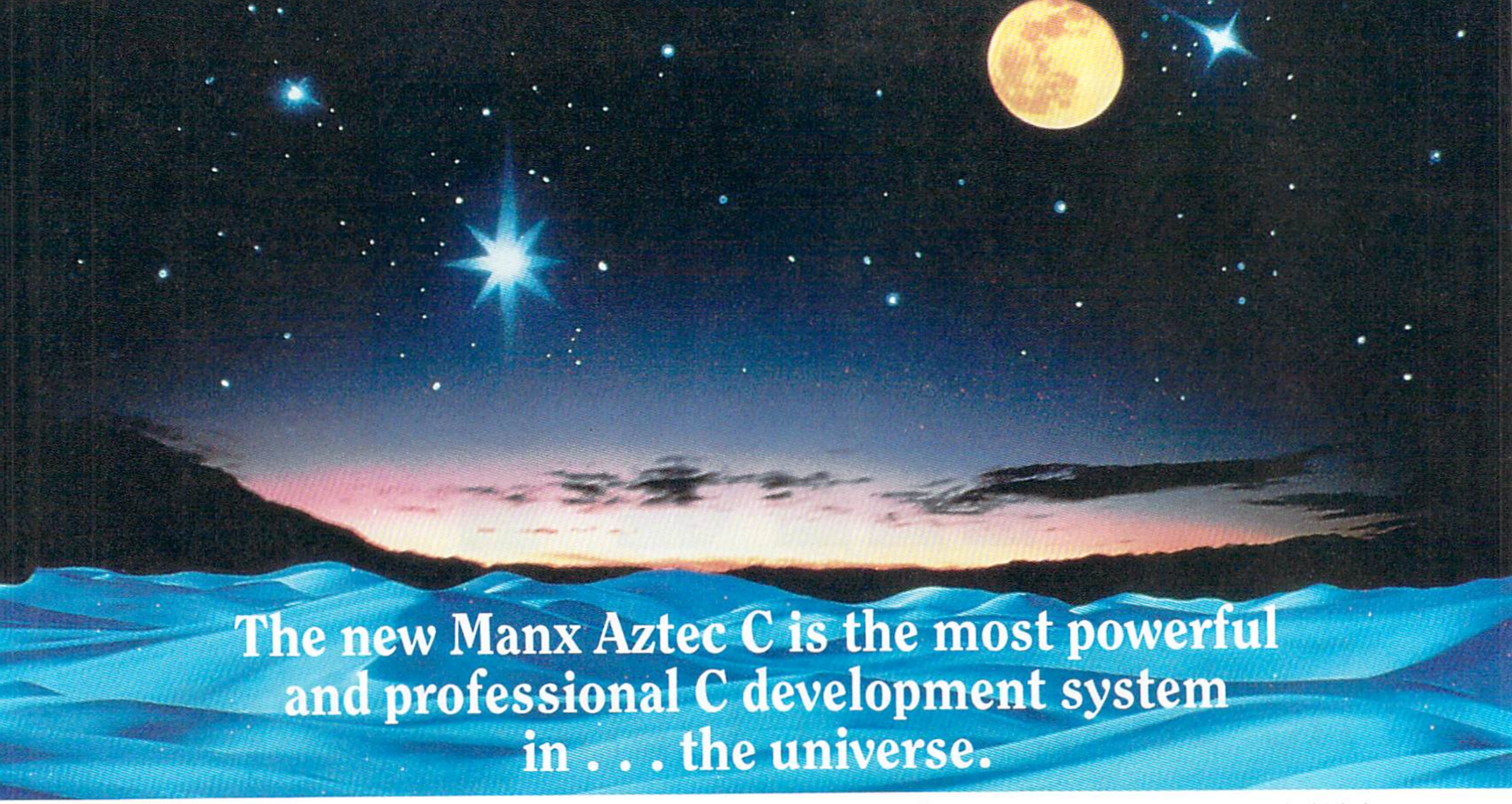
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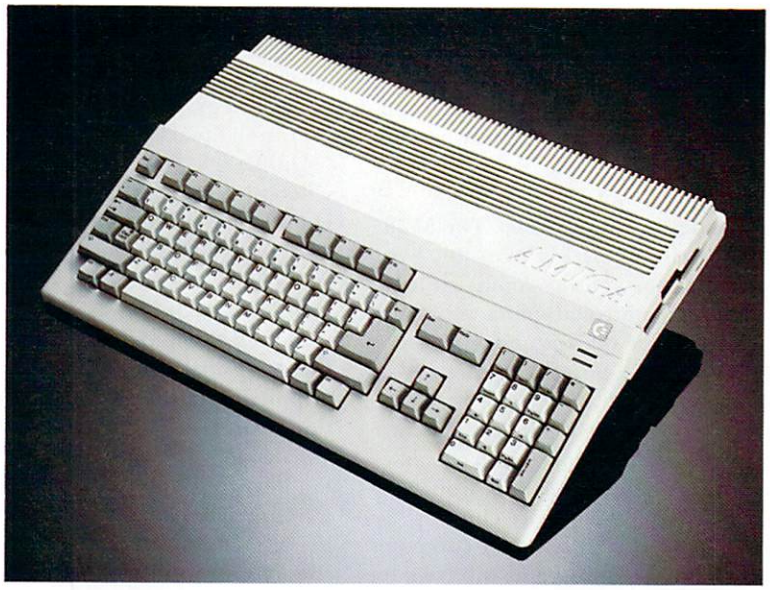
By Bob Ryan

With its three special chips, 16/32-bit microprocessor and multitasking operating system, the Amiga 1000 should have been an enormous success. Instead, sales have been only marginally successful. According to Commodore, the Amiga 1000 was perceived as being an "in-between" machine; considered too limited by business customers and too expensive by home buyers. To satisfy business customers, Commodore introduced the Amiga 2000 (*AmigaWorld*, March/April 1987), which features internal expansion slots and optional IBM compatibility. Hoping to capture the hearts and credit cards of home-computer buyers, Commodore has now launched the Amiga 500. Listing at $649, the Amiga 500 is essentially a down-sized and down-priced Amiga 1000 (list price—$1,295), capable of running any version 1.2 software written for the A1000.

Amiga Muscle

Except for its distinctive Amiga-beige color, you could easily mistake the Amiga 500 for the Commodore 128: The A500's keyboard is built into the system box (like the C-128's), and it sports an external power supply and the same general shape. The cabinet measures about 18½ inches wide, 2⅜ inches high and 12⅞ inches deep. The resemblance ends, however, when you get inside the machine.

With the cover off, the A500 is all Amiga. A Motorola 68000 microprocessor powers the system. This sophisti- ▶



The Amiga 500, showing the location of the 3½" disk drive.

PHOTOGRAPHED BY LARRY DUNN

cated microprocessor is the heart of the Amiga 1000 and 2000 systems, as well as the original Apple Macintosh and Atari ST. The Amiga 500 also uses the Amiga custom chip set to enhance graphics, animation, sound functions and DMA (Direct Memory Access).

Although the internal electronics of the A500 are *functionally* identical to those of the A1000, physical differences exist due to the A500's size. Many functions performed by discrete components on the A1000 have been integrated into large chips on the A500. In particular, the A500 uses the "fat" (84-pin) version of the Agnes custom chip and a gate array (Gary) that contains chip-select logic and part of the floppy-disk controller.

Functions performed by discrete components on the A1000 have been integrated into large chips on the A500.

Pick of the Pixels

The internal circuitry provides the features that make the Amiga 500 a standout graphics computer. Like the A1000 and the A2000, the A500 supports different levels of graphics resolution: from 320 × 200 pixels (picture elements, or dots) with 32 colors to 640 × 400 pixels with 16 colors. At all resolutions, you choose your colors from a palette of 4,096. The Hold-And-Modify display mode lets you have up to 4,096 colors on the screen at the same time.

The A500 also has outstanding hardware and software support for animation, allowing you to move graphics objects around under the control of your programs. In particular, hardware-based sprites and software-based BOBs (Blitter OBjects) make fast animation programming easy.

Remembrance of Things Past

The Amiga 500 comes equipped with 512K bytes of Random Access Memory (RAM) and 256K bytes of Read Only Memory (ROM). The system uses the 512K RAM to store your programs while they are running and to store the pictures and sounds used by your programs. The 256K ROM contains the heart (or kernel) of the Amiga operating system—those programs and routines that supervise the operation of the computer.

You can expand the amount of memory available to your A500 programs by purchasing the A501 Memory Expansion Module from Commodore. This card fits into a compartment on the underside of the computer and connects to the A500 motherboard. The A501 contains another 512K bytes of RAM and a battery backed-up clock/calendar.

The memory on the A501 is not identical to the memory that comes standard with the A500. The 512K built into the computer, "chip RAM," is accessible by both the 68000 microprocessor and the Amiga custom chips (hence the name) that control graphics and sound generation on the Amiga. Since the custom chips can only access this lower 512K of memory, graphics and sound data must be stored there.

The memory on the A501 is called "fast RAM": The 68000 doesn't have to share this memory with the custom chips. The system will automatically load your programs into fast memory, thus freeing more chip memory for graphics and sound data. If your computer does not have fast memory, your programs will have to take up precious room in chip memory. (Experienced Amiga users should note: The memory provided by the A501 board begins at location $C00000 on the Amiga memory map and is not part of the Amiga 8MB autoconfig expansion space, although it is recognized automatically by the system. Thus, the A500 can be expanded to up to 9MB of RAM.)

Since RAM is volatile (i.e., the information in it disappears when you turn your computer off), you need some way to permanently store programs and data. A half-height, 3½-inch floppy-disk drive is built into the A500 to give you 880K bytes of permanent storage.

Cracks in the Black Box

The A500 keyboard is built into the same case that houses the motherboard and internal disk drive. It connects to the motherboard via a ribbon cable. The keyboard is identical to the keyboard of the Amiga 2000. Among its 94 keys are a full set of alphanumeric keys, ten function keys, four cursor-control keys, a numeric keypad and assorted control keys. While Commodore also provides a mouse for inputting data, they do not complete the system with a monitor for output.

Connector Set

Across the rear of the Amiga 500 are the ports that connect the machine to external devices like monitors, printers, modems and the power supply. Looking at the machine from the back, the first two ports on the left are the controller ports for your mouse or joysticks. Although the A500 supports digital (C64, Atari, etc.) and analog joysticks, only the digital type is supported by commercial software developers.

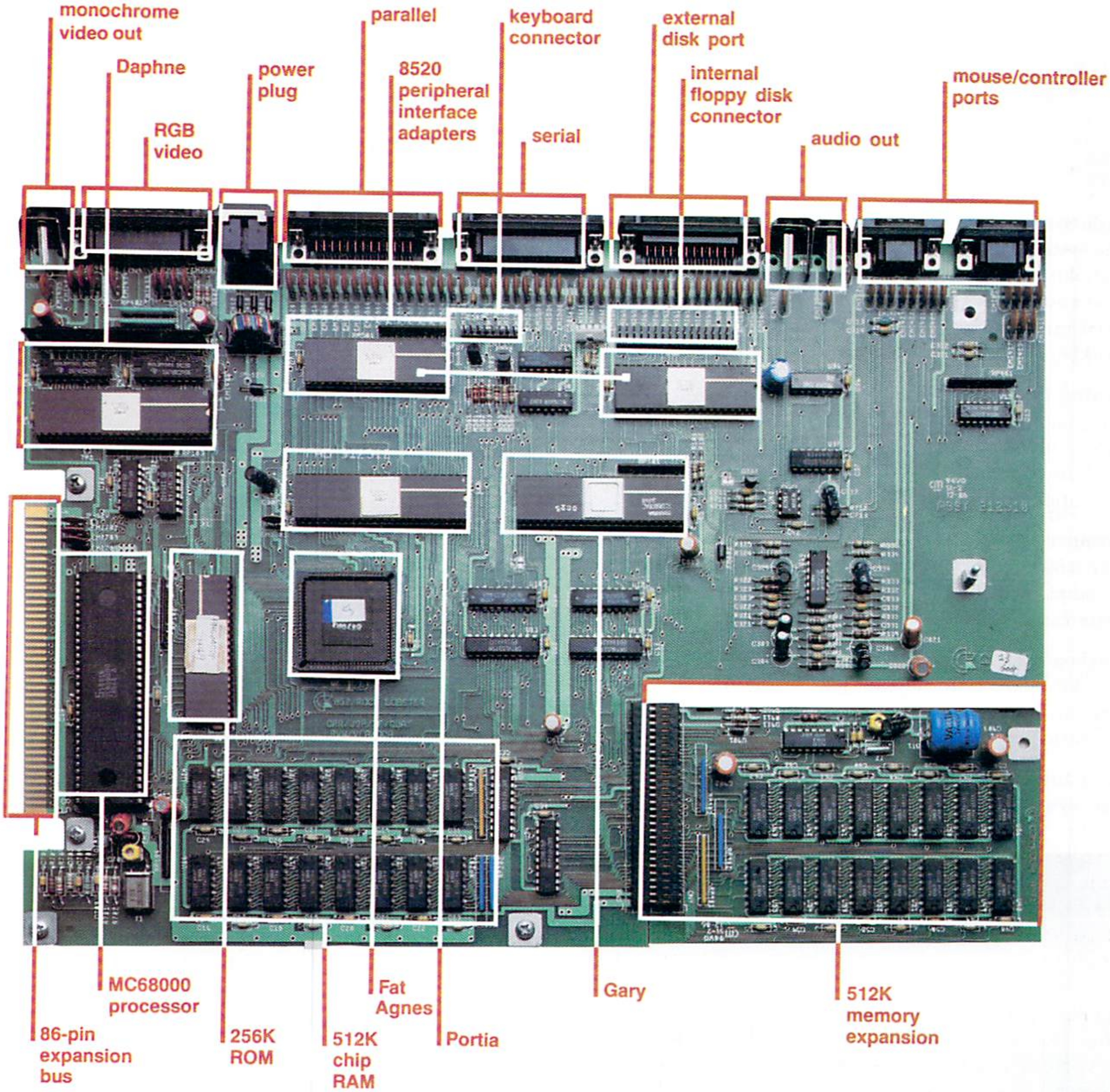
The Amiga 500 has four output channels for sound but only two audio ports, so it combines two channels through the right sound port and two through the left. The sound ports are standard RCA jacks.

The external drive port is designed to accommodate up to three Amiga A1010 floppy drives. Identical to those on the Amiga 2000, the RS-232 serial port and the configurable (Centronics or IBM) parallel port are designed to work with industry-standard cables. The RGB port drives analog RGB monitors like the Commodore A1080 or the high-persistence A2080. High-persistence monitors eliminate the flicker associated with interlaced graphics modes (where the vertical resolution is 400 pixels) on the Amiga.

Unlike the Amiga 1000, the A500 doesn't offer color video out or RF modulated video out. Instead, it provides a monochrome video out designed to be used with inexpensive high-persistence monochrome monitors.

Expanding Universe

Although Commodore is positioning the A500 as the low-end entry point to the Amiga family, they have not crippled the machine by limiting its expansion capabilities. Like the Amiga 1000, the Amiga 500 has an 86-pin expansion bus that you can use to attach many different devices to the system including hard-disk drives and more memory. The catch is that the bus comes out of the left side of the A500 and out of the right side on the A1000. Consequently, unless someone develops an appropriate adapter, you can't use Amiga 1000 expan-



sion devices on the Amiga 500. As of this writing, no third-party company has announced an expansion device for the A500.

Here, There, Software

Due to its sophisticated system software, the Amiga 500 is a multitasking machine, able to run many programs simultaneously. The low-level routines built into the 256K-byte ROM chip let more than one program use the system at the same time. These Exec routines allocate system resources to different programs and keep programs from interfering with one another. The ability to run multiple programs, or tasks, sets the Amiga apart from single-tasking machines like the Macintosh and IBM PC/AT.

In addition to the multitasking Exec functions, the Amiga system software contains hundreds of routines that let applications programmers easily tap the power of the hardware. Also included with the Amiga 500 is AmigaDOS, a multitasking Disk Operating System that complements the multitasking Exec.

In addition to this mostly invisible system software, the A500 comes with Workbench, an Intuition-based program that lets you launch applications and perform many AmigaDOS functions via the mouse by clicking icons and pulling down menus. The Workbench disk contains programs for configuring your system, telling the time, editing your icons, dumping your screen to a printer, setting the keyboard language and, most importantly, accessing AmigaDOS directly with the CLI (Com- ►

Amiga 500 Specifications

Price
$649

Basic System
The system consists of the A500 computer with built-in keyboard, clock/calendar and two-button mouse. The power supply is external. Included software is the 256K ROM multitasking operating system kernel, AmigaDOS Workbench disk and Amiga Extras disk.

Central Processor
The system is controlled by a Motorola 68000 16/32-bit processor running at 7.14 MHz. Three custom chips work in conjunction with the 68000 to aid in graphics, animation, sound and DMA processes.

Memory
The A500 comes with 512K bytes of user memory. Another 512K can be added internally, and eight megabytes can be added externally.

Keyboard
The keyboard is an integral part of the system. The 94 keys include ten function keys, four cursor keys and a numeric keypad.

Disk Drive
The system comes with one internal floppy-disk drive. This half-height 3½-inch drive can hold up to 880K of programs and data.

Ports
The A500 has two mouse/joystick ports, two audio ports, an external floppy port, an RS-232 serial port, a configurable parallel port, analog RGB port and a monochrome video port.

Expansion
An 86-pin expansion bus connects directly to the A500's system bus.

Video Display
Text:
60 or 80 columns × 25 lines; multiple fonts and styles
Graphics:
320 × 200 pixels; 32 colors out of 4,096
640 × 200 pixels; 16 colors out of 4,096
320 × 400 pixels (interlaced); 32 colors out of 4,096
640 × 400 pixels (interlaced); 16 colors out of 4,096

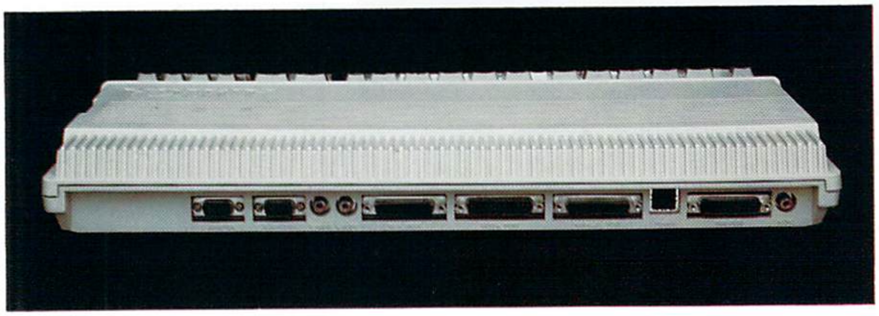
Hold-And-Modify: In each graphics mode, the palette can be switched on the scan line allowing all 4,096 colors to be on screen at once.

Overscan: Allows greater pixel resolution for video applications.

Animation: Eight independent hardware sprites and system software support for software-based animation objects (BOBs).

Sound
Four independent sound channels output as two stereo channels. Each sound channel consists of an eight-bit digital/analog converter and a low-pass filter.

Options
Options from Commodore include analog and high-persistence analog RGB monitors, the A501 512K memory card and external disk drives.□



The back of the Amiga 500, showing the interface ports.

mand Line Interface). The Extras disk contains Amiga Basic, a version of Microsoft BASIC.

Because it is the third in a line of compatible computers, the operating system of the Amiga 500 has attained a respectable level of maturity (read: few bugs). Also, you can find an excellent selection of commercial and public-domain programs for the machine.

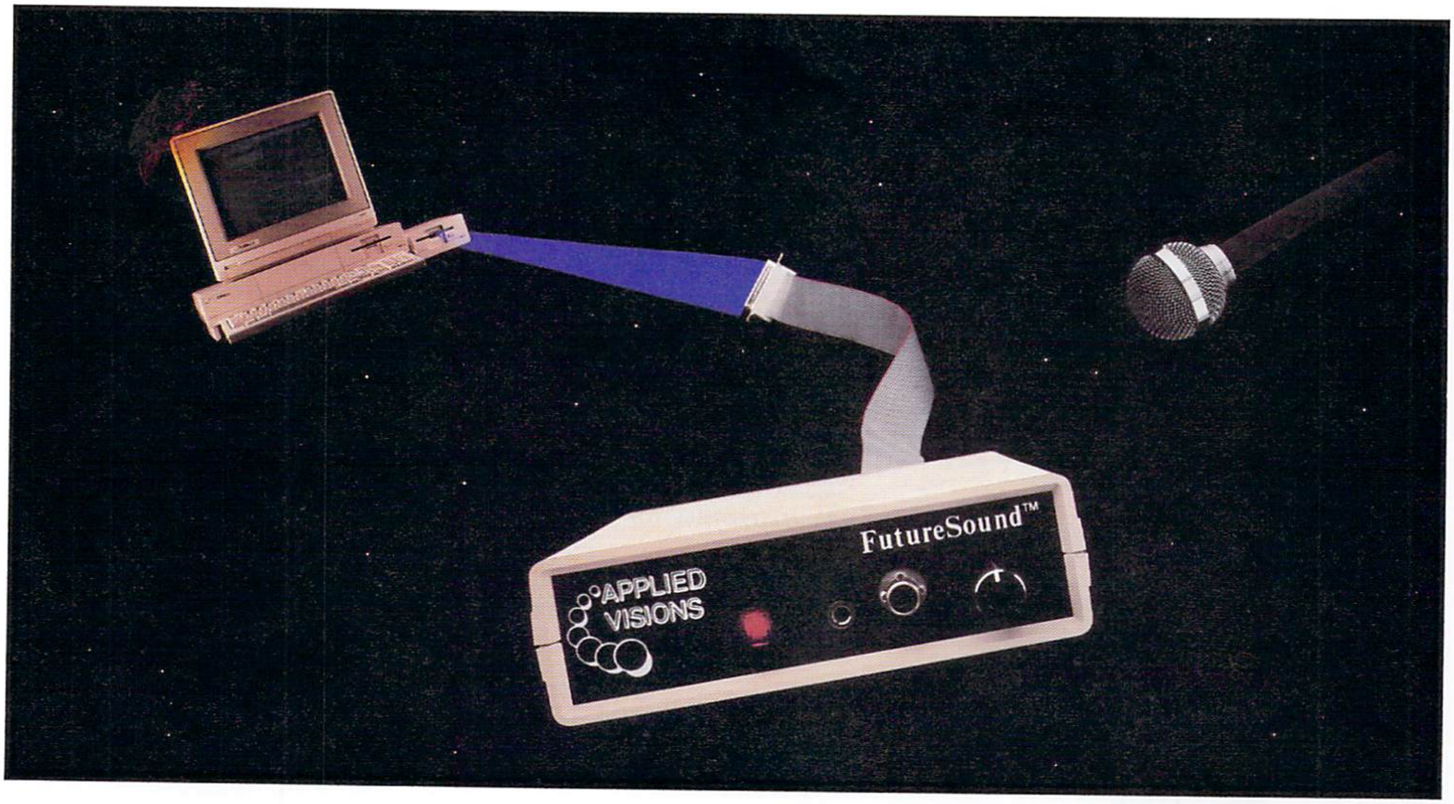
Today and Tomorrow

An Amiga 500 with an analog RGB monitor will probably cost you about $950, which is about $300 less than a comparable Amiga 1000 system. If the A500 is discounted as heavily as the A1000, the combination price could drop another $200 in the next several months.

With the functionally identical A500 selling for hundreds of dollars less, the Amiga 1000 probably is not long for dealers' shelves, although Commodore says they will continue to sell 1000's as long as demand exists for the machine. On the software side, the A1000 will always be able to run the same software as the A500, so A1000 owners have nothing to worry about.

The hardware situation is different. As long as the number of installed A1000s still dwarfs the number of A2000s and A500s, hardware developers will continue to produce products for the A1000. In time, hardware developers will come to view the A1000 market as saturated and stop producing products for the machine. By then, A1000 owners should have acquired all the expansion hardware they feel they need, or find a way to use A500 or A2000 peripherals.

With the Amiga 500, Commodore has brought high-powered computing to people who couldn't previously afford it, which is good news for software developers. As the market grows, all Amiga owners will benefit.■



"Open the pod bay doors, HAL..."

Programmers cast their vote!

Right now, leading software developers are hard at work on the next generation of Amiga® products. To add the spectacular sound effects we've all come to expect from Amiga software, they are overwhelmingly choosing one sound recording package... FutureSound. As one developer put it, "FutureSound should be standard equipment for the Amiga."

FutureSound the clear winner...

Why has FutureSound become the clear choice for digital sound sampling on the Amiga? The reason is obvious: a hardware design that has left nothing out. FutureSound includes two input sources, each with its own amplifier, one for a microphone and one for direct recording; input volume control; high speed 8-bit parallel interface, complete with an additional printer port; extra filters that take care of everything from background hiss to interference from the monitor; and of course, a microphone so that you can begin recording immediately.

What about software?

FutureSound transforms your Amiga into a powerful, multi-track recording studio. Of course, this innovative software package provides you with all the basic recording features you expect. But with FutureSound, this is just the beginning. A forty-page manual will guide you through such features as variable sampling rates, visual editing, mixing, special effects generation, and more. A major software publisher is soon to release a simulation with an engine roar that will rattle your teeth. This incredible reverberation effect was designed with FutureSound's software.

APPLIED VISIONS

Question: What can a 300 pound space creature do with these sounds?

Answer: Anything he wants.

Since FutureSound is IFF compatible (actually three separate formats are supported) your sounds can be used by most Amiga sound applications. With FutureSound and Deluxe Video Construction Set from Electronic Arts, your video creations can use the voice of Mr. Spock, your mother-in-law, or a disturbed super computer.

Programming support is also provided. Whether you're a "C" programming wiz or a Sunday afternoon BASIC hacker, all the routines you need are on the non-copy protected diskette.

Your Amiga dealer should have FutureSound in stock. If not, just give us a call and for $175 (VISA, MasterCard or COD) we'll send one right out to you. Ahead warp factor one!

Applied Visions, Inc., Suite 2200, One Kendall Square
Cambridge, MA 02139 (617) 494-5417

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Amiga CAD

AmigaWorld takes a look at four computer-aided design software programs that turn the Amiga into a professional graphics workstation.

By Louis R. Wallace

Though the Amiga's number-crunching power often lives in the shadow cast by its graphics capabilities, this multi-chip processing power and speed—combined with its superior graphics—makes the Amiga a viable choice for computer-aided design, or CAD. The Amiga is truly well-suited for use as a graphics workstation for professional users of computer graphics. But, as we all know, hardware is only as powerful as the software that makes use of it. This article is about some CAD and engineering software currently available for the Amiga that does take advantage of the Amiga's advantage.

The four software products I have examined are advertised as professional graphic-design tools. They are not computer paint programs, although they do contain some tools (such as points, lines and circles) found in many paint programs.

All are properly called CAD programs. This means they use the processing power of the computer to help in the drafting and design process. In some cases they can be used in the actual testing and simulation of a design concept. While these software packages have similarities, it must be emphasized that they are all different. They are intended for different markets, both in terms of price and performance. So this is *not* meant to be a comparative review. Some were designed for only one use, while others were made for more general application. In the final analysis, what your needs are, and what your pocketbook can withstand, will be the determining factors when you make your purchase.

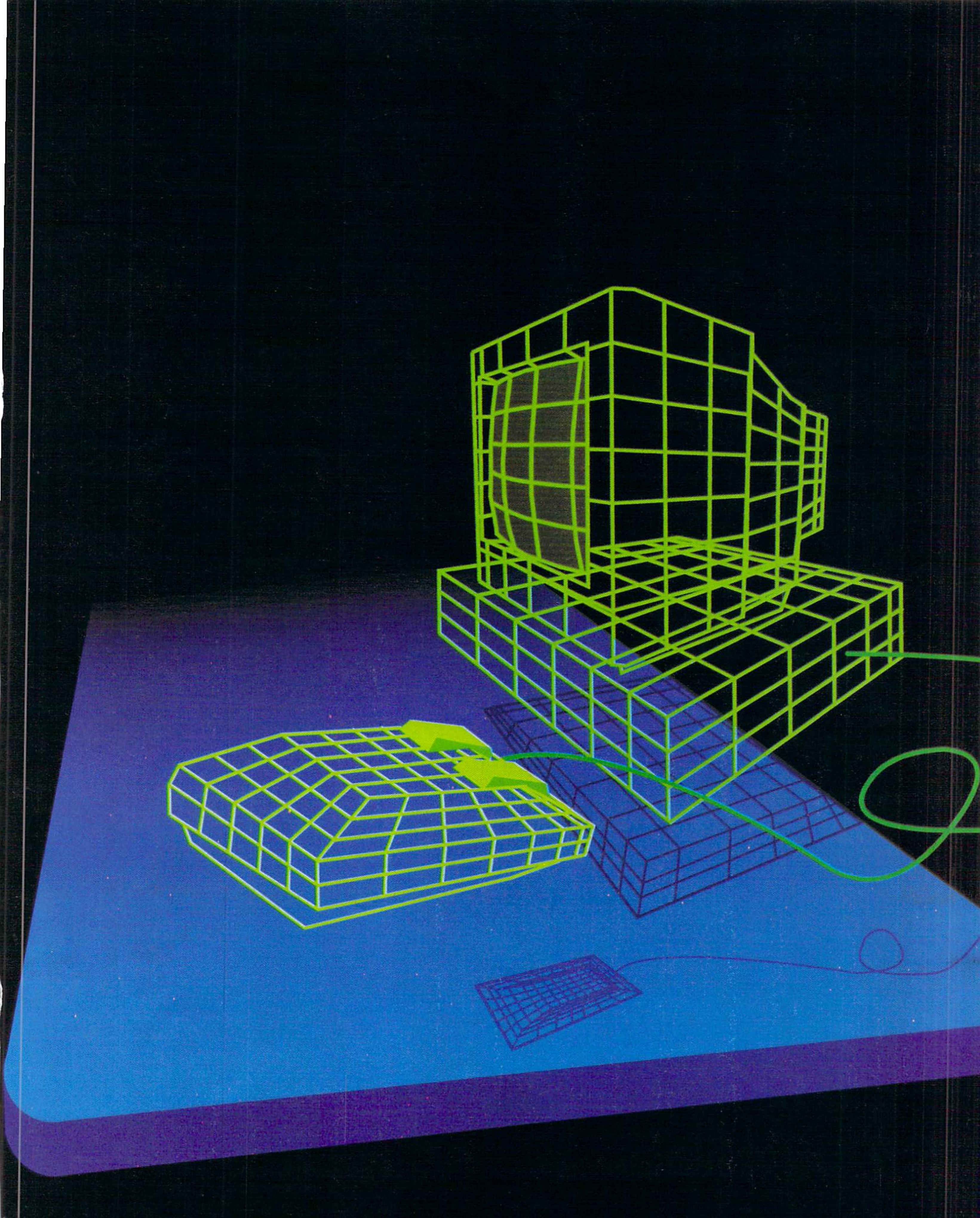
Aegis Draw Plus

Aegis Development made the first entry in the Amiga CAD market with Aegis Draw. They have recently upgraded it and rereleased it as Aegis Draw Plus. I examined this newer version.

Aegis Draw Plus is a general-purpose CAD program. It has a very large number of drawing tools that make drafting easier and more precise than is usually the case when doing it by hand. It uses the standard Amiga Intuition user interface of mouse and menus, but it is also possible to input your data directly from the keyboard. Its normal resolution mode is 640 × 400 pixels with 16 colors. The standard palette was created to minimize the interlace flicker problem, and seems to have taken care of it quite well. You can also switch to the 640 × 200 mode with no loss of data.

The default screen in Aegis Draw Plus has rulers on the bottom and left (which use whatever the currently defined unit of measurement is), and a grid display that makes it easy to line up the various components. You can remove the ruler and grid if you wish. The screen is a standard Amiga window, which can be resized or moved. This is very useful, as you can have several complete drawings on the screen at once, each in a different window. On a standard 512K Amiga, you can have up to four windows, depending on the screen resolution and the size of the windows. With external RAM ►

ILLUSTRATED BY IMAGEBUILDER DESIGN/BOSTON



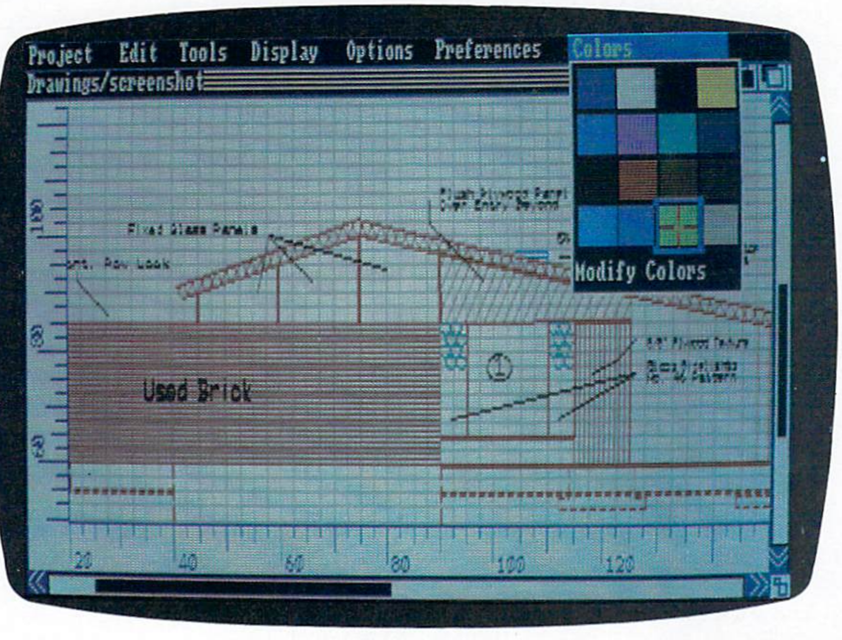
beyond the first 512K, you can have many more windows, although too many causes a quite noticeable slowdown of the program.

Some of the drawing tools are standard graphic functions. These lines, rectangles, polygons, circles, arcs and ellipses are the type found in any graphics program. Unlike a screen-oriented bitmap paint program however, CAD systems treat the graphic elements as *data*, not pixels. Each object is recorded as a piece of data described in memory by endpoints, radius, color, line weight, line pattern, etc. By using data instead of pixels, you have virtually unlimited resolution. You can set the scale of the drawing, and the data remains accurate to whatever number of decimal points you wish. When you need to, you can zoom into an area for fine detail, or zoom out to have a large complex object completely visible on the screen. This often causes the smaller components to appear fuzzy and unreadable, but they retain their mathematical accuracy.

Aegis Draw Plus also contains a special function called Parts. These parts are composite graphic definitions that can be used as a single entity. For example, if you were doing an architectural drawing of a house, and had designed a window that could be used over in this (or some future) drawing, the window could be saved as a part. The part can be saved to disk and used over and over again in many different designs. These parts can be simple or very complex, depending on your needs. And, by saving them to disk, you can create libraries of different parts. One of the additions to Draw Plus is the ability to create a parts list from a drawing. This list, an editable ASCII text file, can be used to show the complete list of, and number of, parts used in a drawing. For example, if you have created a schematic from a library of electronics parts, you will often find this parts list feature very useful.

Draw Plus also has many other tools.
You can explode a part into its basic pieces in order to edit it.

Aegis Draw Plus. A medium-resolution architectural drawing showing the grid and side rule display options and the color menu.



You can pick up and move selected objects from a drawing, even rotate or clone them. Dimension is a very useful tool that allows you to point to any two spots on the drawing, and have a set of dimension arrows drawn with the exact distance between the two points, using the current units of measurement you have set Draw Plus to. Another new feature is the Hook tool. This tool, similar to the tool found in Aegis Animator, allows you to add, delete and move individual points on an object.

Draw Plus has many other features besides these drawing tools. It has the regular cut-and-paste, undo and erase features for editing, but it also contains a large battery of features that are concerned with modifying a drawing. You can resize objects, rotate them, distort them in the x and y direction, and change colors, patterns and drawing weights. Of course, a set of objects can be grouped into a part, which can be reused or saved to disk. You can use the Mirror function to create a mirror image of an area of the screen and reflect it in one of eight directions. For even finer control, you can use the Array command to create a series of rotated objects. This allows you to easily make defined symmetrical objects.

Draw Plus also allows the use of layers. These layers can be drawn separately and then combined. A good example of a drawing that would use layers is a printed circuit board. Another would be a house plan that has the electrical wiring as one layer, the plumbing as another and the structure itself as a third. Draw Plus supports up to 255 layers.

An important part of any drawing program is how well it will produce a hardcopy. Draw Plus supports a number of different plotters, including those from Roland. In fact, a new promotion is underway that involves Roland, Aegis and Commodore: If you buy a Roland plotter from a participating Roland dealer, you will receive a free copy of Aegis Draw Plus.

You can also save your drawing to disk for later editing or in IFF format so it can be used by a number of different graphics programs. And, as I mentioned, you can even save it as a parts list. If you wish, you can dump the picture to the dot-matrix printer as a standard screen dump, or you can use a more sophisticated form of printer dump developed by Aegis. This involves creating a very large bitmap display of the drawing in memory and then scaling it so it will print out as an 8″ × 10″ drawing. The quality of this screen dump is one of the best I have seen, but it is, of course, not as good as a plotter drawing.

Aegis Draw Plus is a very good general-purpose CAD package. It is a little more expensive than Aegis Draw, but the improvement is significant enough to justify the $250 price tag. (Draw was $200.) It has very good documentation, and it uses the Amiga Intuition interface quite well. It could be successfully used for a variety of drafting tasks. As the least expensive CAD package available, it offers a lot for your money. On the down side, it is a general-purpose program, which means that it lacks some of the more specific and useful features of a program dedicated to a particular task. For example, it does not have features like auto-routing—often used in circuit

board drafting. It cannot be used to simulate a circuit, or produce drill lists, but it was never meant to do these things. It does very well what it was designed to do. However, if you have specific needs in mind, perhaps another package would be better for you.

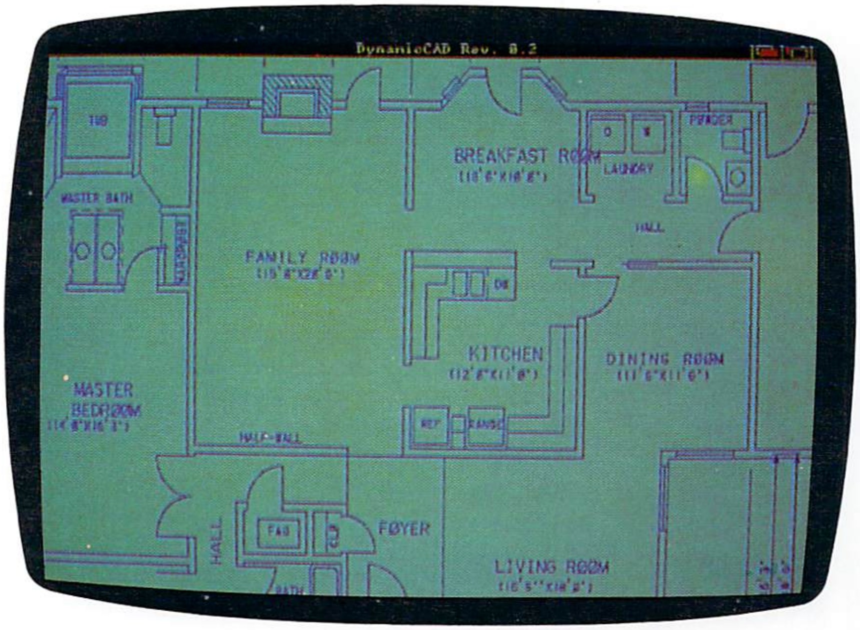
Dynamic-CAD

Dynamic-CAD from MicroIllusions is a powerful drafting system, suitable for electrical engineering applications and, to a lesser extent, architectural applications. It is in some ways a higher-level CAD system than Aegis Draw Plus and is also more expensive, selling for $495. It defaults to the 640 × 400 interlaced mode, but can be switched to 640 × 200 without loss of your drawing. As with Aegis Draw, Dynamic-CAD's color palette was designed to eliminate flicker in the high-resolution mode, and does a very good job of it. I think that these drafting programs prove that, although you cannot use *all* of the Amiga's 4,096 colors in hi-res mode with the standard monitor without unbearable flicker, some color combinations can be successfully used without flicker.

Dynamic-CAD offers a very extensive symbol library, almost exclusively dedicated to those symbols needed by electrical engineers. Symbols are selected as alphanumeric codes from the keyboard, not with the mouse. Unfortunately, this requires you to be constantly referring to the manual's appendix, or to memorize a large number of codes. (Most of Dynamic-CAD's options work by keyboard entry.) You can also create your own symbol libraries, called pseudo symbols. These can be simple or complex, depending on your needs. They can also have information embedded within them, giving rise to an intelligent pseudo. These intelligent pseudos allow a user, such as an electrical engineer, to create net lists from the schematic drawings. One of the nice features of these pseudo symbols is the ability to scale and rotate them to any size or degree of rotation you might need. This can be accomplished by a keyboard command sequence, such as EP45XYZ\20. This Enters Pseudo XYZ at 45 percent of the original size and rotates it at a 20-degree angle.

Dynamic-CAD has a number of different drawing tools, such as lines, circles and arcs. They can be solid or patterned as dashes. Lines can also be used that contain curves and angles at each end—useful in many mechanical engineering and architectural drawings. And dimensioning of lines is supported. You also have a choice of four different line weights. Text can be entered in several sizes, with the LeRoy font used by many draftsmen. It can be centered or justified left, right or even in relation to the top and bottom of the drawing.

Dynamic-CAD has a zoom feature that is quite versatile and powerful. You can quickly halve or quarter the drawing with a couple of keystrokes, allowing you to see more of a large drawing, or you can pick a small area and zoom into it, enlarging it many times. A more global sizing of the drawing is available from the parameter menu. Here you can set both the percent of



Dynamic-CAD. A floor plan displayed in high resolution.

scaling and the alphanumeric ratio for the text. The scale allows you to fit what would be a large drawing onto your comparatively small monitor screen. You can set the scale from one percent to 100 percent. The alphanumeric ratio allows you control over the text size when scaling a drawing. For example, you might reduce the size of the drawing enough to get it all on screen at once, but that could make the text unreadable. By adjusting the ratio for the text, the text can be made to appear larger and more readable.

You also have multiple-layer capability, up to 8,191 levels—many more than most users will ever need. You can set which of these levels is visible, and you can have up to eight levels visible with each defined in a different color.

Dynamic-CAD also supports some isometric functions. These are often used with mechanical-type drawings, and allow you to automatically present an object from different viewpoints. The documentation states that this was developed for simple isometric piping diagrams, and future upgrades may incorporate more features.

One potentially powerful feature is the Automatic Schematic option. This allows you to generate a schematic drawing from a net list. However, you will usually need a schematic diagram in order to generate a net list (a function supported by Dynamic-CAD with its Net option) unless you can get the net list from some other source. To get this net list, you first make a rough schematic, connecting the lines without worrying about the appearance of the diagram. Once this rough schematic is finished, you create the net list using the Net function, then use the Auto feature to make a more polished schematic drawing. Once the various devices have been placed in their proper positions, the Auto feature will hook them together using the net list as a guide. Unfortunately, the documentation is not completely clear on this quite important function.

Dynamic-CAD is a powerful drafting package, espe- ►

cially for electrical engineering applications. However, the documentation is very poor, often to the point of being confusing. It has no decent tutorial in it, and a package like this really requires one. Another drawback is its lack of an Amiga user interface. The mouse menus are sparse, and the use of only specialized keystrokes is really a step backward for a program running on the Amiga. What might be an acceptable user interface for an IBM-PC or mainframe terminal is simply substandard on an Amiga. That's not to say you could not learn it; it would just take more time (and a better manual) to do so. It reminds me of Wordstar on MS-DOS machines; once you know it, you can do a lot with it, but how painful that learning process can be!

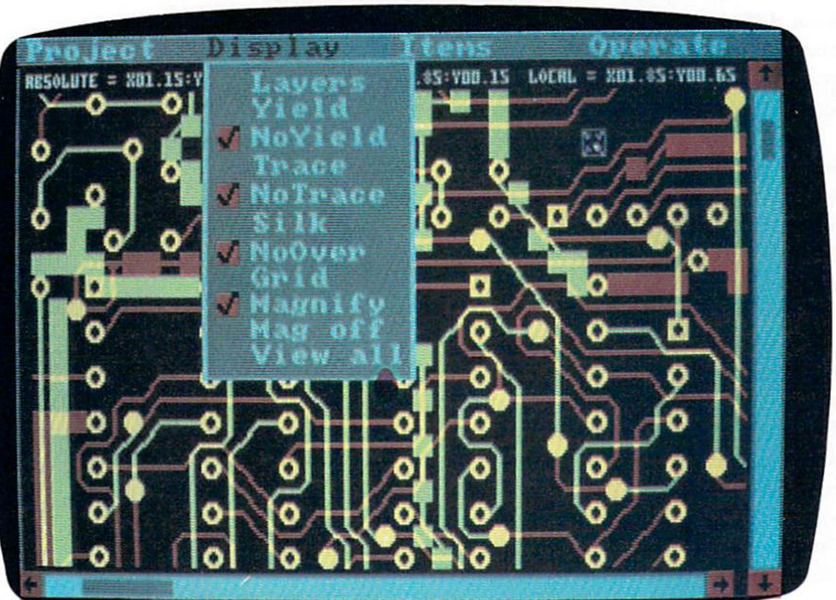
As a final note, I received a call from MicroIllusions just before finishing this and was told that a major revision was being done of Dynamic-CAD; this may be available by the time you read this. And if you are a purchaser of Dynamic-CAD, you should take them up on the Extended Support Policy, an extra cost option that allows you to get updates as a registered owner.

PCLO

PCLO (Printed Circuit LayOut) from Softcircuits Inc. is a specialized drafting program designed to produce camera-ready printed circuit board designs. It can be used by a draftsman or an engineer who wants (or needs) to bypass the drafting department. Its price is not minimal ($1,000), but it is comparable to similar programs for the IBM-PC community.

PCLO is the only one of these programs that uses the Amiga's low-resolution mode of 320 × 200. This was done to make sure all the processing power of the microprocessor is available to the program in an Amiga with only 512K, and to make maximum room in memory for the data that describes the printed circuit board. You have the option of using interlaced mode, but it only creates a smoother display, not a higher-resolution display.

PCLO. A low-resolution zoomed screen with the display options menu open. Printed circuit layers are in different colors.



PCLO uses the standard Amiga Intuition interface; it is quite easy to use and learn. It supports some multitasking, and I was even able to run it several times concurrently using external RAM, although the version I used was not supposed to support external RAM expansion. I did not extensively check it while running the additional tasks.

PCLO's workspace is divided into an invisible grid of 256 × 256 cells, where each cell represents .050 inches square. This is a total of 12.8 inches per side, but, with some planning by the user, boards much larger than that can be made. You create the printed circuit board by a combination of mouse and keyboard entry. By using the mouse menus you can select dips, sips and pin grid arrays and place them where you want on the display. When ready you can use the auto-route routine to connect the various connections. Individual cell definitions can be entered and edited by positioning the mouse pointer on the cell you want and pressing the appropriate key, and a printed circuit element, such as a pad, trace or hole will appear. Or you can edit the contents of a cell by positioning the cursor on that cell and pressing a key on the numeric keypad. The different elements (10 different types) include thin and thick traces, vias (holes filled with solder), pads, groundplanes, nodes and holes.

PCLO supports an unlimited number of layers, but only two layers plus the silkscreen layer can be displayed at one time. You can store up to nine layers on a single Amiga disk. One of the interesting features of PCLO mentioned in the manual is that it actually performs faster as your data load increases. This is due to the dense matrix techniques used by the program. And, it supports the 68010 by activating the "tight loop" mode, and the 68020 by executing most machine code within its own chip memory cache.

PCLO supports auto-routing of single traces and has some assistance when running busses that consist of multiple parallel traces. On the small boards I checked it on, it was quite fast—a second or less. You can limit the area of the board the program will route to speed it up even more. One thing it did not do was prepare net lists or drill tapes, but the manual indicates that utility programs to do so might eventually turn up. A program as expensive as this should supply these features.

You can save components of a wide range of complexity to disk libraries for later use. These blocks can be inserted into a drawing at any position or orientation and space can be inserted into the board to accommodate the added block.

Basically, PCLO is a very good program that can be used to generate camera-ready printed circuit boards. It has a good manual, but it could be improved both in content and in the quality of its reproduction. It does what it claims to do, and does it well. Even though it uses the low-resolution mode, the graphic display is very good and the printed circuit board is well represented visually. The editing features are very good, and it seems to use the proper mixture of mouse, menus and the keyboard. It could be used quite easily in a ▶

Circle 159 on Reader Service card.

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■ VizaWrite is well behaved, allowing you to use the multi-tasking capabilities and run several programs simultaneously.

■ VizaWrite is broad minded, allowing you to include text from Textcraft, pictures from Graphicraft, Deluxe Paint ® **and most other products.**

■ VizaWrite comes ready to run, no installation of the software is required and will run in 256K of RAM on one or more drives. Comes supplied with Workbench 1.2 and requires Kickstart 1.2 or greater.

■ Because VizaWrite is well behaved, it supports all peripherals, such as hard disk subsystems, as long as they are also well-behaved.

■ Automatically sets text into pages while editing. Text is always shown as "What you see is what you get."

■ Headers and footers show at the top and bottom of each page; they can be one or more lines and have their own font style and margins.

■ Ruler lines control page layout. Margins, tabulations, justification and line spacing are all adjustable using the icons on the ruler line. Rulers can be introduced anywhere in the document. Rulers can be hidden from view, if required.

■ Move between pages instantly: no waiting for disk accessing - select any page to work on.

■ Copy, cut and paste by highlighting text with the mouse.

■ Move around the text by pointing with the mouse or by using the cursor keys. Scroll through the document, forwards or backwards.

■ Edit and save any standard ASCII file. All character codes above the space character can be used in a document. Supports all international characters.

■ VizaWrite documents retain pertinent information when saved - such as author, creation date, notes, alteration count etc.

■ Open as many documents onto the screen as will fit into memory. VizaWrite uses memory extremely efficiently, and works with the AMIGA operating system in the standard way.

■ Mail merge from a standard ASCII file with configurable item delimiters. Alternatively, mail merge from a VizaWrite document, where each name and address is held in its own page.

■ Optional configuration file permits the varying of many operation defaults, such as standard document size, screen colors, margins, tab stops, etc.

■ Document history window, used to log author's name, creation date, amended date, etc. Shows document statistics, such as word and sentence counts.

■ Glossary system permits single-keystrokes recall of frequently used phrases. This is inserted directly into the document at the current typing position, instantly.

■ Supports fixed-width font printing on any preferences-selected printer. Supports proportional printing on certain printer types only (this is a limitation of the printers). Recommended dot-matrix printer is NEC PINWRITER P6/P7, recommended daisywheel is JUKI 6100 or any DIABLO compatible. HP LaserJet is the recommended laser printer using the "F" font cartridge. The AMIGA proportional screen fonts are printed in high resolution on supported dot-matrix printers. Daisywheel users can use proportional print-wheels to print out documents laid out using the proportional screen fonts.

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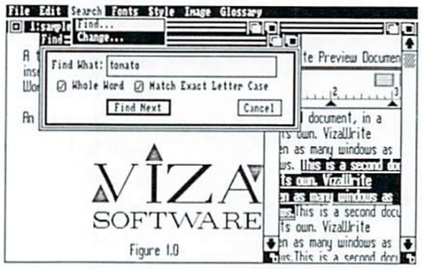
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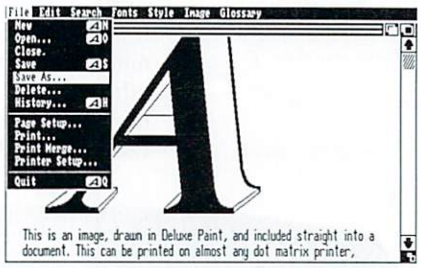
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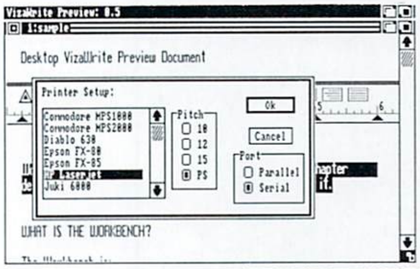
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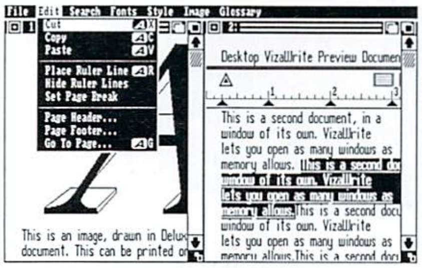
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professional environment. Updates and improvements are being planned for PCLO.

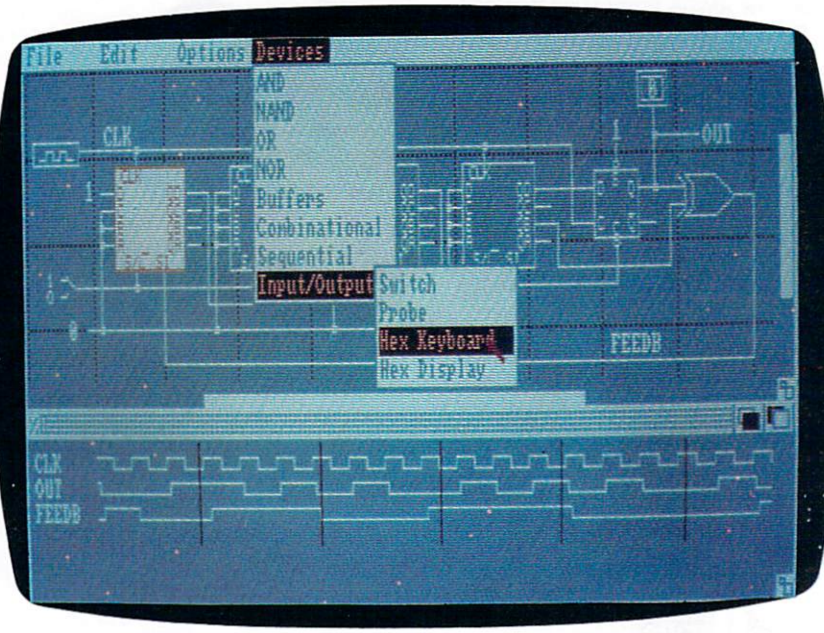
LogicWorks

Another important CAD program is LogicWorks from Capilano Computer Systems Inc. LogicWorks sells for $200. It allows you to design, test and debug digital circuits by drawing the schematic diagram. It uses the 640 × 200 graphic display and allows you to draw in an area of 38 × 38 feet—much larger than most real world needs. The drawing is controlled by the mouse, using line segments and the predefined devices.

LogicWorks actually simulates the operation of the circuit, which is always live and active. You can get immediate electrical feedback at all times using logic probes and hex readouts. You can supply inputs into the circuit via hex keypads, clock generators and toggle switches. You can also get simultaneous dynamic graphical output in the form of timing diagrams. And, you can even input more complex stimulus by drawing directly on these timing diagrams. You have the option of setting propagation delay times of the devices while simulating the circuits operation.

It uses the Intuition menu interface for most of its operations, with minimal keyboard inputs. You load and save files using the Intuition project menu found in many Amiga programs. It offers a menu of editing features like cut and paste, zap (remove a component), copy and clear. You can edit in both the schematic window as well as the timing diagram.

LogicWorks has dozens of pre-made logic devices, such as NOT, AND, OR, NAND, NOR and XOR gates. It also has D and J flip-flops, counters, shift registers, multiplexers, decoders, clock generators and many other devices. You can create your own devices and device libraries. It also allows the use of PROMs and PALs, truth tables and AND-OR or AND-NOR arrays.



LogicWorks. A medium-resolution schematic display showing some menu selections. The top window shows the digital circuit; the bottom window is where the "live" circuit is simulated.

It does not support plotter output, but you can get screen dumps of the schematic and timing diagrams on a dot-matrix printer. If the image is larger than the screen, it does multiple screendumps to get the rest of the drawing.

LogicWorks is an unfinished program, and free updates of the final program will be supplied to the buyer. The device librarian (used in creating your own devices) was unfinished in the version I used, but Capilano Computer Systems felt that it was important to get the program into the hands of users so they could begin to use its many other features. The program is easy to use and learn, and the documentation is clear and well made. It is well suited to engineers, technicians, hobbyists and students.

High-quality CAD software is available for the Amiga technical community. If you want to use the Amiga as a graphics workstation for computer-aided design, you should seriously consider the products covered here. Depending on your needs, you can very likely find a program that will do what you want. But since this type of software is in general fairly expensive, make sure a program does what you need before you buy it.■

I would like to thank Douglas E. Reich, past president of the student IEEE association at the University of Florida for sharing his time and technical expertise.

Louis R. Wallace is a research chemist and a computer specialist who contributes to several computer magazines. Write to him at 6124B SW 11th Place, Gainesville, FL 32607.

CAD Programs

Aegis Draw Plus ($250)
Aegis Development Inc.
2210 Wilshire Blvd.
Santa Monica, CA 90403
213/306-0735

Dynamic-CAD ($495)
MicroIllusions
PO Box 3475
Granada Hills, CA 91344
818/360-3715

LogicWorks ($200)
Capilano Computer Systems Inc.
PO Box 86971
N. Vancouver, BC
Canada V7L 4P6
604/669-6343

PCLO ($1,000)
Softcircuits Inc.
401 SW 75th Terrace
North Lauderdale, FL 33068
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Expanding Your Memory

Want to expand your Amiga's memory? How much: one, two . . . eight megabytes? Here is a survey and review of memory expansion devices currently available for the A1000.

By Mark L. Van Name and William B. Catchings

The Amiga's great processing power is sometimes limited by its maximum of 512K internal memory. Most Amiga software requires 512K, and some programs—especially some newer ones—push that minimum even higher. Several companies are offering memory expansion units for upgrading your A1000 to anywhere from one megabyte (MB) to the maximum of 8.5MB. *AmigaWorld* located and evaluated as many of these products as possible; our goal was to take a good look at what you can buy today and see how well these units do their job.

The news is good: Every product worked well. For the hard facts, from total capacity to price, see the chart on p. 43. Be aware that the products we examined are all designed for the Amiga 1000, and are not likely to work with the newer Amiga models that will be released this year.

Do You Need More Memory?

Before you buy a memory expansion unit, make sure that you need it, or, at least, that you can use it. Additional memory can help you in several ways. You can run more applications simultaneously. You can use some applications, such as extremely large spreadsheets, that will not fit in the standard 512K. Such memory also can speed up your day-to-day activities by offering a larger RAM: disk. You can copy Workbench into RAM:, or edit documents there, to avoid unneeded disk accesses.

These products sometimes include software that further increases their utility. For example, the Convertible memory board from ASDG Inc. comes with a *recoverable* RAM: disk. This RAM: disk, unlike the standard one, will keep its contents across warm restarts, even after most guru meditations. Microbotics offers a similar feature as a part of their optional Multifunction Module for Starboard 2.

1.2 and Auto-config

You'll find most of these products simple to use—as long as you are running version 1.2 of the Amiga system software. If you're using 1.1, special software provided with the products is needed, as well as extra work on your part. Avoid the hassle and buy the 1.2 software. We tested these boards only under version 1.2.

The expansion units work better with 1.2 because of a feature called *auto-config*. Auto-config boards tell the system of their presence automatically. You do only three things: first, remove the cover from the bus expansion slot on the right side of your system; second, plug the memory unit into that slot; third, turn on your system with its new expanded memory. Only the PowRCard, from RS Data Systems, is not an auto-config unit. It did come with a Workbench disk that correctly installed it under the version 1.1 system, and a spokesperson for the company said that an auto-config board was in the works.

Source of Power

Though you install the boards similarly, they do have their differences. In particular, they differ in how they draw power and interact with the system.

The Alegra, AX2000, PowRCard, Xpander II (2MB version) and StarBoard 2 products draw their power from the Amiga's bus expansion card. That bus transmits power with a rating of 1 amp and 5 volts. While no consensus exists among the manufacturers on the limits this rating imposes, all agree that it is enough to run at least one 2MB board. Some, such as RS Data Systems, claim their products can run a full 8MB off this power, while others, such as Comspec Communications, claim that a maximum of two of their units (4MB total) can use the bus.

We were unable to test accurately the power draw of all of these units, so we cannot give you any hard and fast rules about what is safe. If you do overtax your power supply, the result can be a fried CPU and/or power supply, with other damage to your system unit possible. It is obviously wise to be careful.

The Convertible, RAM-BOard, RAMEX and Smarts Card products do not draw power from the bus expansion card. Instead, they expect to be housed in an expansion chassis that includes a power supply. This removes the chance of hurting the system unit, but increases their cost. If you upgrade the Xpander II product to 4MB, the second board also comes with its own power supply. If you are planning to go beyond an additional 2MB of memory, either buy one of the units that comes with its own power supply or make the manufac- ►

turer convince you that your system's power supply will not be overloaded.

System Interaction

The products also differ in how the memory interacts with the system. All those that draw their power from the bus communicate with the system over the standard Amiga 1000 86-pin bus. These side-mount devices are stand-alone products.

Commodore has established a hardware expansion standard for the Amiga called *Zorro*. The Zorro standard specifies a 100-pin bus and a standard size for Amiga expansion cards. The Convertible, RAMEX, and Smarts Card cards obey the Zorro standard and will work in any Zorro expansion chassis. The ASDG Convertible memory cards also will work in the ASDG Mini-Rack-C, a relatively inexpensive expansion chassis that is not completely compatible with the Zorro standard. TechniSoft's RAM-BOard unit has its own power supply, but does not support the Zorro standard. It supports only TechniSoft's memory cards.

Before you buy any expansion memory you should be aware that Commodore has complicated the situation even more than the above two "standards" (side-mount and Zorro) indicate. The A2000 supports a *revised Zorro* standard. This standard differs electronically only slightly from the current Zorro specifications. But the new standard card size is very different: Revised Zorro expansion cards will be the same size as those designed for the IBM PC/AT family. Currently, there are no cards available that conform to the revised Zorro specs.

What They Look Like

The expansion units also differ in physical design. Some come in thin packages that sit unobtrusively beside your system, while others rest atop it. Most try to blend in with your Amiga. Some don't.

The ASDG Mini-Rack-C that came with the card we tested is an industrial black case that stands out like a sore thumb. The Xpander II also does not mesh well, as it is short and wide and yet sits beside the system. These are admittedly minor gripes. The PowRCard causes more serious complaints. First, it overhangs the front by several inches. Most of the side-mount units correctly chose to overhang the back for extra space; this one did not. More importantly, it is designed so that part of it rests on the mouse connector, putting weight and strain where none should be. Finally, the sample we tested also put stress on the bus expansion. We could slide an envelope under the rear of the unit because its weight was being borne entirely by the bus card and the mouse connector.

How They Perform

Forget how they look...which one is fastest? We ran a test that read the values in a chunk of the expansion memory and wrote them back in the same location. To allow for possible vagaries due to the Amiga's multitasking, we ran the test at least five times on every board.

There was no consistent winner. In fact, all of the boards reported the same results most of the time. Some claimed to have no wait states while others did not address the issue, but we believe that you are unlikely ever to notice any difference in performance between them.

Why They Differ

When you are trying to decide what product to buy, sometimes just price and whether it works are not enough. Other things merit consideration.

The user manual is sometimes important. As easy as it is to install these products, you really don't need much of a manual. That is usually what you get: a two- or three-page guide, over half of which typically discusses how to make the unit work with the 1.1 software. Two manuals stand out. The Comspec AX2000 manual is clean and well-suited for the novice user. It explains everything from how best to use the extra memory to the unit's specifications, in clear language. If you are a hardcore techie, however, you will like the manual for the ASDG system. It tells everything about that product and how it works with the Amiga, in over 20 packed pages.

Production quality is another, more nebulous consideration. You are not likely to need to open your expansion unit and peek around inside, but we did. All were reasonably well built and solid. Except for the ASDG product, the Zorro-compatible products and the RAM-BOard showed several wire traces. This is often indicative of a faulty or changing design, which could be explained by Commodore's repeated revi- ►

Company List

Alegra
Access Associates
491 Aldo Ave.
Santa Clara, CA 55054
408/727-8520

AX2000
Comspec Communications
153 Bridgeland Ave., Unit 5
Toronto, Ont., Canada M6A 2Y6
416/787-0617

Convertible Memory Board
ASDG Inc.
280 River Road, Suite 54A
Piscataway, NJ 08854
201/540-9670

PowRCard
RS Data Systems
7322 SW Freeway, Suite 660
Houston, TX 77074
713/988-5441

RAM-BOard
TechniSoft
PO Box 7175
Murray, UT 84123
801/268-4961

RAMEX Memory Boards
Interactive Video Systems
15201 Santa Gertrudes Ave., #Y-102
La Miranda, CA 90638
714/739-5020

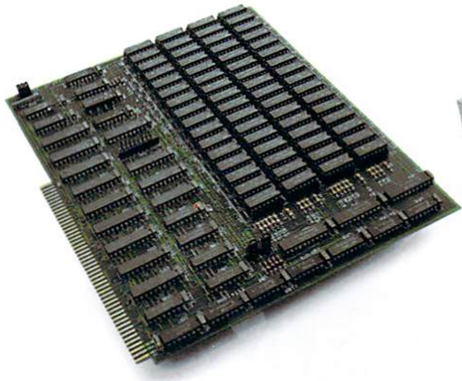
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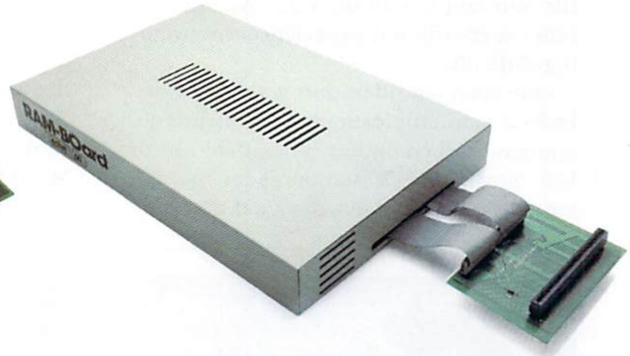
Starboard 2
Microbotics
811 Alpha Drive, Suite 335
Richardson, TX 75081
214/437-5330

Xpander II
Pacific Cypress Technologies
46127 Landing Parkway
Fremont, CA 94539
415/656-1974

Memory Boards







Product	Capacity	Cost	Auto-config w. 1.2?	Pass Thru?	Stand-alone or Chassis?	Power Own or Bus?	1.1 Software?	Top or Side?	FCC Rating	Approx. Dimensions
Alegra[a]	½MB	$379	yes	no	S-A	Bus	yes	side	Class B	9 × 4 × .75
AX2000	2MB or 1MB	$899 or $749	yes	yes	S-A	Bus	yes	side	Class A	9 × 4 × 1.5
Convertible Memory Board[b]	2MB per board	$600 for 2MB CH extra	yes	no	CH	own	yes	side	Class A	10 × 9.5 × 6
PowRCard[c]	2MB–8MB	$600 to $2195	no	yes	S-A	Bus	yes	side	Class B	14.5 × 8.5 × 3
RAM-BOard[d]	2MB, 4MB, 6M, 8MB	2MB is $600	yes	yes	S-A	own	yes	top	none	11 × 2 × 17
RAMEX Memory Boards[e]	1MB or 2MB per board	1MB for $450, (CH extra)	yes	no	CH	own	yes	top	none	13 × 4 × 17
Smarts Card[f]	To 2 MB	$400 for 0MB	yes	?	S-A or CH	own	?	side	none	?
Starboard 2[g]	½MB, 1MB, 2MB	$495, $595, $879	yes	yes	S-A	Bus	yes	side	none	10 × 4 × 1.5
Xpander II[h]	½MB, 1MB, 2MB	$600 to $700	yes	no	S-A	Bus	yes	side	none	9 × 2.25 × 8

[a]A future unit is planned to allow expansion to 2MB by installing 1MB chips.

[b]Board available with only ½MB. 2MB board is $600 and requires either standard Zorro or Mini-Rack-C chassis. Mini-Rack-C is $195 and not completely Zorro compatible. FCC Class B approval in progress.

[c]Can be upgraded with piggyback board and chips. Boards: $599.95 unpopulated (0MB); $799.95 for 2MB; $1,129.95 for 4MB; $2,195 for 8MB. We couldn't verify the claim that full 8MB will run from bus power. Unit weight is partially supported by the mouse connector.

[d]Additional 2MB is $380 at time of purchase or $399 later. Chassis is for its own boards only; not Zorro compatible. FCC approval in progress.

[e]Expands at 1MB or 2MB per board, but boards come in only 1MB—for 2MB, you must add chips. Requires either RAMEX Busbox (Zorro) chassis, $499.95, or other standard Zorro chassis. We evaluated a prototype: No FCC approval yet.

[f]$399.95 for an unpopulated board (0MB) and enclosure with power supply. You add chips to 2MB. We couldn't tell about pass-through because we evaluated a prototype card only and didn't see the stand-alone Smarts SA unit (was not ready; therefore, no FCC approval yet). The card requires a Zorro chassis or its own box. The prototype didn't have 1.1 software. Dimensions of planned box unavailable.

[g]2MB requires a daughterboard.

[h]Can go to 4MB using an expansion board. $699 for chassis and 2MB board; $599 for additional 2MB, which comes with its own power supply. A second card can be purchased that passes through the bus. The cards are almost completely Zorro standard, but using them in a standard Zorro chassis requires cutting three wire traces.

sion of the Zorro standard, which these poor companies must struggle to follow! While not exactly a sign of poor construction, the Xpander II unit that we were sent came with its card completely unconnected and loose in the chassis. We had to open the unit and mount the card. We hope that other users will not experience this annoying difficulty.

One final consideration is the level of Federal Communications Commission (FCC) approval. All computer systems sold in the U.S. must pass FCC standards for the amount and frequency of signal that they emit. Systems that are to be used only in commercial activities must have Class A approval, while those that may be used in homes must have the stricter Class B approval. Only the Alegra board actually had an FCC Class B sticker on it. The manufacturers of the ASDG chassis, the PowRCard, and the Smarts SA units claim to have Class B approval either finished or in the works.

How to Expand More

Many of these products come in several configurations, ranging from 512K to 8MB in capacity. Often the cheapest alternative is to buy one in its smallest capacity and then to add memory chips yourself. All of the units that offer this ability (except the Comspec AX2000) can be upgraded with any standard, 150ns, 256Kbit DRAMs. The expandable units come with instructions about how to add chips and how to inform the board (usually with jumpers) about the extra memory. If you feel comfortable opening up the unit, handling a circuit board and inserting chips into sockets, consider this route. But, if you want to avoid any hassle and just plug in and go, be sure you get the product already loaded with all the memory you need.

And the winner is . . .

You. Trite, but true. Most of these products are solid offerings with much to commend them. We have no clear favorite. At best we can recommend a few different products for different reasons. Check the accompanying chart for the details, and take a few minutes to consider your needs before you make up your mind.

If you can be permanently content with an extra 512K, at $379 the Alegra board cannot be beaten. The RAM-BOard, at $599.95, is the cheapest of the fully populated 2MB units. You can get 2MB for a bit less money by buying the unpopulated Smarts SA unit for $400 and then buying and installing 2MB of chips (under $200 if you shop around). If you want an expansion chassis and can live with two slots, consider the ASDG Mini-Rack-C or D. At just under $800 for the Mini-Rack-C and a 2MB card, ASDG offers a price competitive with many stand-alone units, with its own power supply and a second slot (useable only by their boards) as extras. If you have about $1,050, you can get six Zorro slots in the Busbox system from Interactive Video Systems, with a 2MB board in one of them.

You will find that extra memory will not only change what you can do with your Amiga system, but can change how you feel about your system; for example, once you have worked for a while with a 1MB or larger RAM: disk, you won't want to go back. All in all, the memory expansion devices available for the Amiga are sound and easy to use. You should be able to find what you need at a price you can afford. ■

Mark L. Van Name is vice president and co-founder of Foresight Computer Corp., and a freelance writer. Bill Catchings is a freelance writer and software developer. Write to them at 10024 Sycamore Road, Durham, NC 27703.

Thanks for the

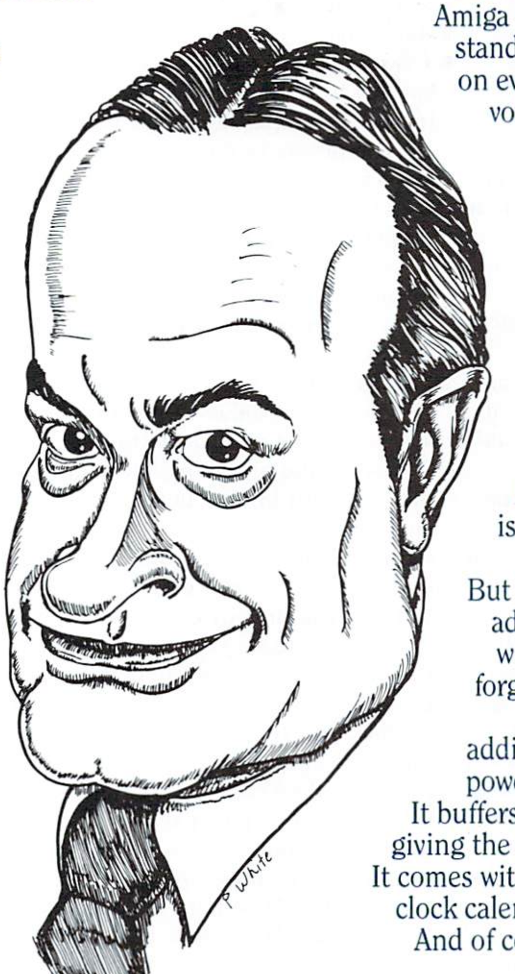
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*Using Workbench 1.2

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HARD DISK

Finally, a hard disk drive for the Amiga made to the same exacting standards as the AX2000. It runs on every voltage from 95 to 260 volts. It uses 50 or 60 Hz. It's available simply as a SCSI host adaptor, a SCSI host adaptor and controller, or as a complete 20 Meg. hard drive. In fact the machine accepts hard drives starting from 10 Meg and up. The hard drive can be combined with the AX2000 to provide up to 8 Meg of RAM memory. Adaptability is the definition of Comspec's new hard disk drive.
But the hard disk is more than adaptable. It comes standard with features you won't soon forget. A built-in power supply gives the Amiga an additional 2 amps of necessary power for use with peripherals.
It buffers the Amiga expansion bus, giving the computer better flexibility.
It comes with a built-in SCSI port. The clock calendar has a battery back-up. And of course it's auto-configuring.

*Specs subject to change.

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Shopping the Boards

By Peggy Herrington

Amigaville is our new column on telecommunications, bulletin boards, user groups, news, special events and other hot items. This issue Peggy H. (a high-tech coupon-clipper) tells you how you can find some great programs at super-saver prices by pound'n the boards.

The other evening I went shopping and found some real bargains. I picked out four Workbench fonts including one like the IBM PC uses, a new Topaz, a boxy design and one with borders (IBMFONT.ARC, NEWTOPAZ.ARC, BOXFONT.ARC, BORDER.FONT). NewTopaz has a utility that shows any font in a NEWCLI, and they all work great with Notepad and DeluxePaint. The graphics selection was great: Eric Graham's animated juggler (JUGGLER.ARC)—this issue's cover story—plus a map of the night sky from your latitude/longitude (STARCHART.ARC) and an Aegis Animator file (AEGISCLOWN). I got a MIDI sequencer for my Casio CZ-101 synthesizer (CZ-MIDI.ARC), a CZ patch editor and librarian (PATCHLIB.ARC) and a program by the author of DeluxeVideo for editing IFF digitized sounds (MAKESOUNDS.ARC).

I picked up some interesting information about Sidecar (SIDECAR.TXT) and Genlock (GENLOCK.SPECS) and a series of amusing dialogues on the Amiga in general (MONOLOG-1.ARC through -5). Oh yes! . . . and a utility (PRTDVR.ARC) for designing custom printer files for people with off-beat printers, like me. (At last my Morrow letter-quality will underline!)

By now, you've probably surmised that I was in a different sort of "store." I used my modem to shop American PeopleLink's Amiga Zone, with a map (ZONEMAP.ARC) to help visualize the message and data libraries and live conference area. (Try CONFerence some Sunday at 9PM CST.) Besides transferring these files, I read and posted some messages, and at sign-off was informed I'd been there 2 hours, 47 minutes. At $4.95 an hour (1200 baud), all of it cost less than $15—how can you complain about that?!

Downloading is a snap once you get the hang of it, and although you must operate from the CLI, partly because many public-domain programs don't have icons, it's very much worth your while. For this session, I used COMM1.32, a public-domain terminal program downloaded previously from Plink, because, among other things, it has WXmodem, an error-checking protocol that substantially speeds Telenet and TYMNET transfers.

To get the most for your money, whatever network you're on, use shortcuts. On Plink, /qscan any one or all 15 sections of the data library for the preceding few months, capturing the list in your buffer. Then sign-off and pick out (by name and library section) what looks interesting from those very brief descriptions. Go back online (/GO 68; LIB will take you directly there) and open your buffer again to save the longer file descriptions you'll get before you download. Many contain information you'll need later. Try a download or two using the menus, then go out of the library and type /ADV to turn them off. Type /TOP; SECT *x*; REA; TITLE substituting the library section number of the file you want for *x*. For a descriptive paragraph, carefully type the file name at the prompt. If you want it, type /DLO; FIL; XMO or WXMO provided your software has WXModem protocol. Then type RAM:*program.name* in the requester after you elect to receive it with your terminal software. This sends the file to RAM:, which is faster than disk. Type /TOP; SECT x; REA; TITLE again if you don't want it, or to get the next description after a completed transfer.

Do *not* download to RAM: unless you're using V1.2 operating system software and starting your terminal program by RUNning it from the CLI. Otherwise, "Murphy" will make sure you never see those files again. And download ARC016 (or a later version) if you get a file with an .ARC name extension. This utility compresses files for faster transfer and eliminates the need to strip Xmodem padding. (Put it in a disk directory with the .arc'd file and type whatever you called ARC, say, ARC016 E *filename.arc* to re-Expand a file when you're offline.) Because computer memory is finite, if you download to RAM: you should periodically transfer files to a previously formatted disk while you're online. Get behind the terminal screen (use the gadgets or Amiga-N and -M), and type CD RAM:, then LIST and COPY #? TO DF0: or DF1:. Clear out RAM: by typing DELETE ?. Before you go back to your terminal, get out of RAM: with CD DF0: or DF1:. If it doesn't happen automatically, save your buffer to disk after signing off. You can read it, or any text file, from the CLI with TYPE *filename*.

Public-domain programs are available from many user groups and electronic bulletin boards, too. If you want to call computer-using friends and boards in 25 cities from Boston to L.A. during non-business hours for a flat fee of $25 per month (no long distance charges), call PC Pursuit's 24-hour FREE BBS at 800/835-3001 with your modem, or 800/368-4215 voice for details. It's a great service. A list of 245 Amiga boards is in FINALLIST.ARC on Plink. To find out how to subscribe, call voice 800/524-0100 or 312/870-5200.

Amigaville is devoted to helping you get the most from online services and user groups. Although I can't reply personally, I'd love to have your ideas and experiences for future columns. Write to me at the address below or c/o *AmigaWorld*.■

Peggy Herrington is a Contributing Editor to AmigaWorld. *Write to her at 1032 Forrester St. NW, Albuquerque, NM 87012.*

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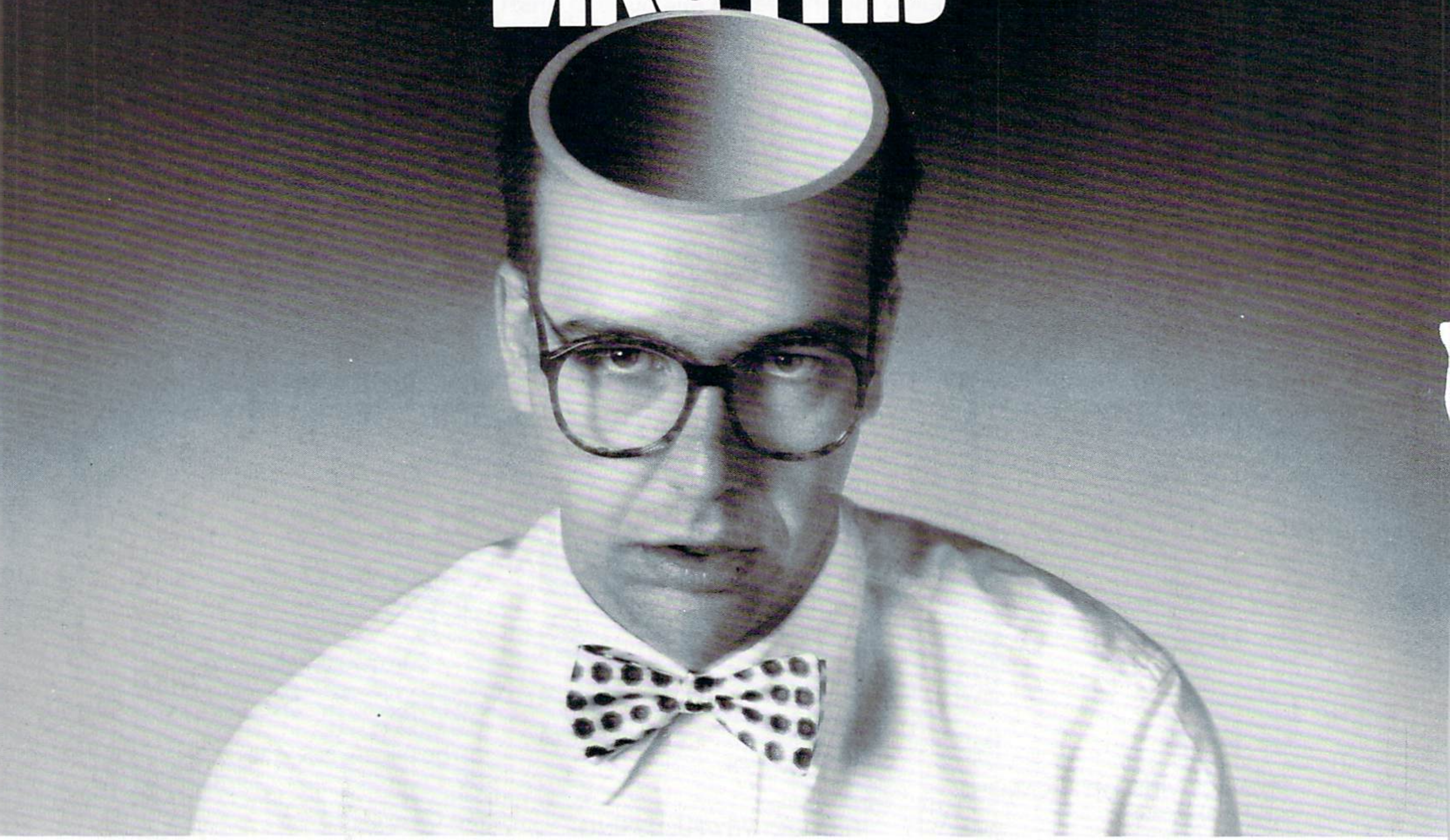
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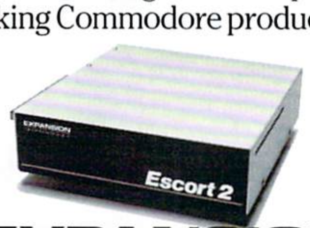
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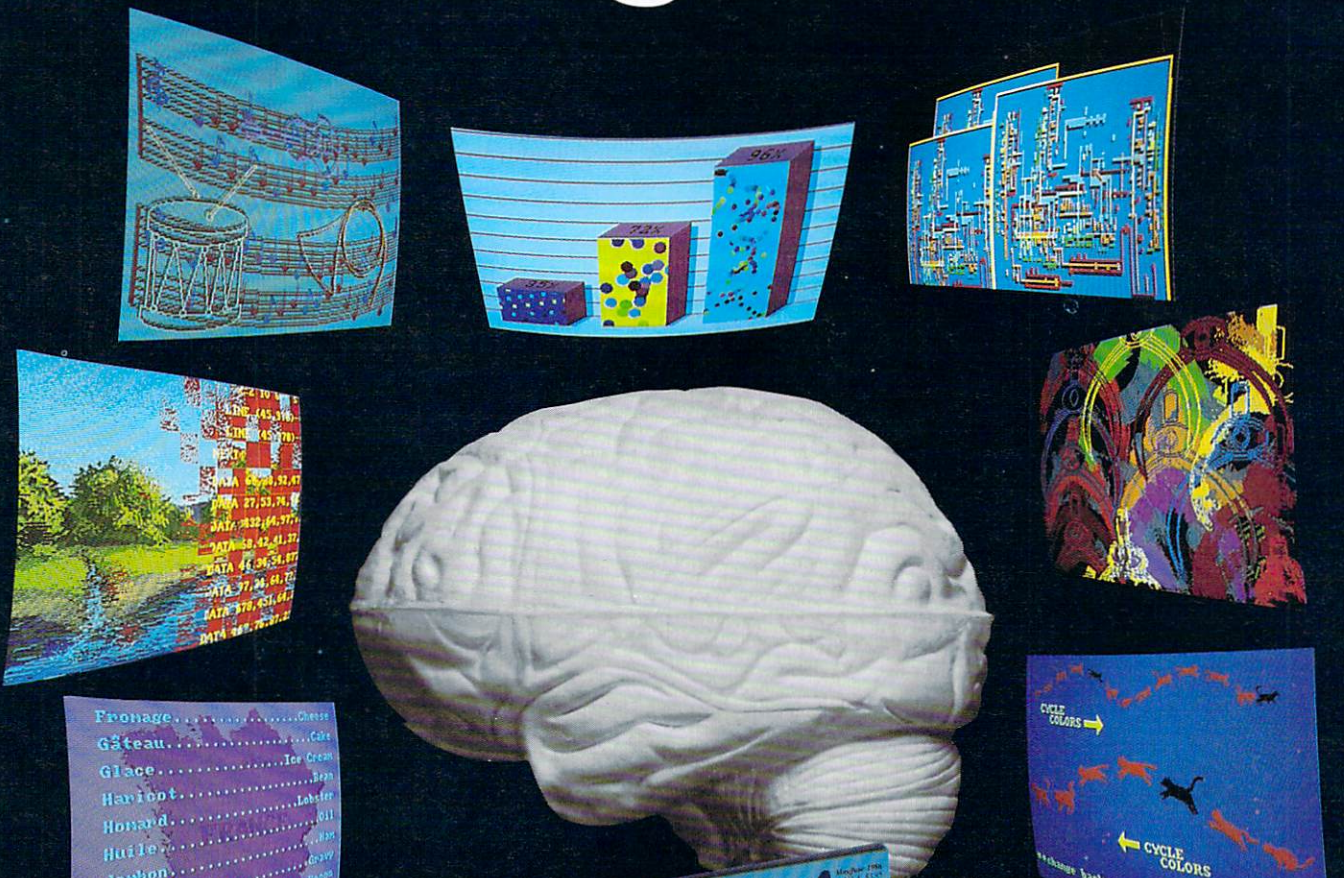


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Help Key

Once again, his task complete, our hero gallops off across the bit-planes into the sunset. Happy trails, Binary Bob!

By Bob Ryan

The Mark of Zorro

Q: My first question is about hardware. Nowadays, we hear a lot about the Zorro 100-pin expansion specification. I have an Amiga with an 86-pin expansion bus. How is the Amiga's bus related to the Zorro specification, and will Zorro products work on "old" Amigas?

My second question concerns the IFF text standard developed by Electronic Arts and adopted by Commodore. If this standard is used in word processors and desktop-publishing programs, will I be able to use these different programs and preserve font type, underline, italics and other special formatting when I move my documents from program to program?

Julius A. Bazan
Bayside, NY

A: The IFF FTXT (Formatted Text) definition does preserve fonts and styles so that different programs supporting the standard can interchange documents. Though few programs do now, expect more to adhere to this standard in the future.

In response to your first question, the Zorro 100-pin specification describes the 100-pin slots that make up a Zorro expansion chassis. If you don't plan to buy an expansion chassis—a box that you put expansion cards into—you don't need to worry about this stuff. All Zorro expansion chassis connect to the 86-pin expansion bus on the side of your Amiga 1000. There is no Amiga that has an external 100-pin expansion bus: The number of pins refers to the size of the slots, not to the size of the Amiga expansion bus.

The problem with hardware expansion on the Amiga is that we now have two Zorro specifications. The original Zorro specification called for a square card; the revised specification, as announced at last fall's Monterey Developer's Conference, calls for an oblong card and changes the definition of some of the pins. This revised specification is what is used in the Amiga 2000 and in products like CSA's Turbo-Amiga Tower (see What's New?, page 86). A lot of major developers, such as Byte by Byte and ASDG, developed and marketed products before the Monterey Conference. Many of their products no longer adhere to the Zorro "standard" although they developed them in good faith. Commodore pulled the rug out from under them.

As an Amiga 1000 owner, you have two ways to go: You can buy a chassis built to the original Zorro specifications, or you can buy one that adheres to the revised Zorro specifications. The advantage of the former is that there are many boards available now that fit into the original Zorro boxes. The disadvantage is that, although there are perhaps 150,000 Amiga 1000s around the world, Commodore isn't going to build any more of them. Consequently, since this segment of the market is no longer growing, don't expect to see a lot of *new* boards introduced into it.

The advantage to buying a chassis that adheres to the revised Zorro specifications is that you will be able to use boards designed for the Amiga 2000. The downside is that the number of boards currently available for the 2000 is small, although you can expect this number to grow in the coming months. Many manufacturers, such as the aforementioned ASDG, are planning to support the revised standard as well as their original Zorro products.

If you want to buy an expansion chassis for your Amiga 1000, and just about all your expansion needs can be filled by the boards on the market today, then don't worry about the revised Zorro specs and buy an original Zorro chassis. On the other hand, if you can afford to wait for boards to become available, then buy a chassis that conforms to the revised Zorro specs. This will ensure compatibility with Amiga 2000 boards and with future Amiga products—unless Commodore changes the specs again. Whichever way you go, always make certain that the boards you buy fit your chassis.

Spilled Paint

Q: When I run the following Amiga Basic program, the area enclosed by the circle is all that should be painted. Instead, as soon as the color.id variable is greater than one, the entire screen is filled with the specified color. That's not what the Amiga Basic manual says should happen. Any help? Here's the program:

```
SCREEN 4,320,200,4,1
WINDOW 3,"paint.test",,31,4
maxcolor = 15
FOR color.id = 0 TO maxcolor
  CIRCLE (150,100),100
  PAINT (150,100),color.id
  NEXT color.id
SCREEN CLOSE 4
```

Dr. Bruce Cohen
Baltimore, MD

A: The problem here is that the Amiga Basic manual in not clear about the function of the PAINT command. The command has the following syntax:

PAINT [STEP](x,y) [,paintColor-id [,borderColor-id]]

The only thing you *must* supply with the PAINT command is the location of a single pixel in the area you want to fill. If you don't supply color parameters, they default to the current foreground color. In your example, you supply a paintColor-id using the variable color.id. When you supply this paint color and not the border color, the border color automatically assumes the value of the paint color. Armed with this information, let's see what happens during one pass through your loop.

Assume that the color.id variable equals four, so the painting color is orange. First, your program draws a circle with the current foreground color (which is color one—white—since you ►

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LASER BARRIER BROKEN

Historic first: Amiga creates typeset quality text with laser printer

You are reading history. You are reading the first published examples of typeset quality, laser printed words created on a desktop publishing program for the Commodore Amiga. Yesterday, it was impossible. Today, it's within every Amiga owner's reach with Gold Disk's PageSetter 1.0 Desktop Publishing Software and the breakthrough new PageSetter LaserScript program. Reports, forms, flyers, and even newspapers can be created with a whole new level of professionalism.

PageSetter LaserScript adds an exciting new dimension to the already powerful PageSetter 1.0. In addition to providing the four most popular laser typefaces (with more on the way), PageSetter LaserScript gives you complete control over type style and size. It also frees you to change the position and size of entire pages, including the power to rotate them if you want. There's even an option to create custom templates, a time-saving feature the frees you from repetitious formatting and re-formatting. And it works with any PostScript laser printer.

"PageSetter LaserScript is just the beginning of a series of breakthrough desktop publishing programs from Gold Disk", reported a company spokesperson. "We are committed to making the Amiga the premier desktop publishing machine, and we have products in development that are going to do just that." A reliable inside source reports that a big announcement is due in the near future.

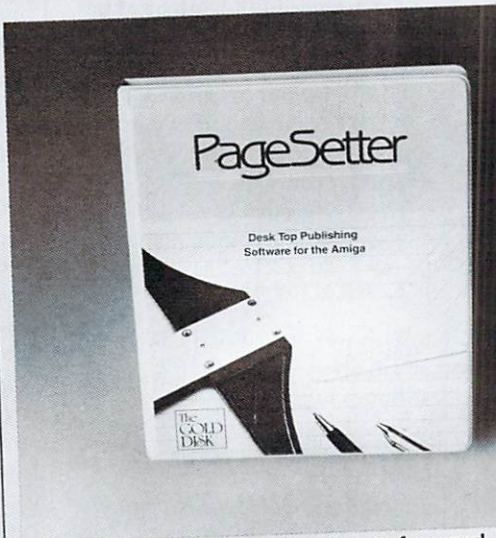
Prices are extremely competitive. PageSetter 1.0 remains priced at $149.95, while the new PageSetter LaserScript will be priced at $44.95.

In related news, Gold Disk also announced the availability of a special disk containing over 25 fonts for dot-matrix printers including the Times, Helvetica, and Courier typefaces. Gold Disk is calling their new product FontSet I and is pricing it at $34.95.

EMERGENCY TELEPHONE NUMBERS SET UP TO COPE WITH DEMAND

Gold Disk Inc has set up emergency telephone numbers to help anxious Amiga owners locate their nearest PageSetter 1.0 retailer.

"Anyone in the continental United States can reach us toll-free 1-800-387-8192", said a Gold Disk spokesperson. "All other callers should dial 1-416-828-0913" Customers can also reach Gold Disk by addressing mail to: Gold Disk Inc, P.O. Box 789, Streetsville Ontario, Canada, L5M 2C2



PageSetter 1.0 takes a giant leap forward.

PageSetter 1.0 The Only Choice For Serious Desktop Publishing

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Amiga owners don't need a laser printer to take advantage of the power and simplicity of PageSetter 1.0. All that's needed is an Amiga compatible dot-matrix printer. A truly intuitive user interface makes page design a snap. In the normal mode, what you see on the screen is exactly what you get when you print out the page. You can also pull back to view the entire page, or zoom in to edit up close. There are even a variety of borders, shadows, and shading patterns to choose from. PageSetter 1.0 is a fully integrated page layout program. You can create your documents with the built-in word processor, or create graphics in the built-in graphics editor. Of course, you can always import documents and drawings from other Amiga programs like TextCraft, Scribble!, Deluxe Paint or Aegis Images.

didn't issue a COLOR command). Next, your program executes the PAINT command; it paints the area around the specified pixel location with the color orange. It paints until it reaches a border *whose color is defined by the borderColor-id parameter.* In your program, the borderColor-id defaults to the paint color. The PAINT command will fill the area with orange until it hits an *orange* border; your white circle has no effect. Since there is no orange border in your program, the PAINT command fills the entire screen. To get your program to work as you want it to, you should specify the current color.id in your CIRCLE command:

```
CIRCLE(150,100),100,color.id
```

This way, your PAINT command will always have a border to bump into.

Bug Report

Q: In the November/December '86 Help Key, you stated that the Amiga doesn't support analog joysticks. This is incorrect. According to The Amiga ROM Kernel Reference Manual: Libraries and Devices *(pages 346–347), the Amiga does indeed support analog or relative joysticks. The manual does state, however, that "there is no direct system software support for proportional joysticks or proportional controllers." The routines to open a gameport device with a proportional controller are the same used with the mouse or a digital controller, except that you must use GPCT_RELJOYSTICK. Then, according to the hardware manual (pages 220–224) you must reset the POTGO register and wait for the next vertical blanking period to read the potentiometer registers. I'm familiar with all this because I've been trying to get my Amiga to read some photo-transistors for a project dealing with ophthalmology. No luck yet—hopefully version 1.2 of the operating system has better support for analog joysticks.*

Scott Dunbar
Bourbonnais, IL

A: Thanks for the correction. A quick check of the documentation that accompanied the Version 1.2 Enhancer Software didn't turn up anything new on using analog joysticks with the Amiga. As of this writing, I don't know of any commercial software that supports analog joysticks directly. Check the What's New? section of this issue, however, for news of a joystick that emulates proportional control.

Alternate Output

Q: Do you know of any services that would transfer my Amiga 1000 creations to other media such as videotape, laser printers, plotters, slides and photographs? I can't afford to invest in equipment like the Polaroid Palette/Imprint system, but I'd like to get the same results.

David Miller
Port Townsend, WA

A: You can videotape from the Amiga 1000 yourself by connecting your VCR to the Amiga video out with a double-ended RCA cable. The results are not of the highest quality, since the Amiga NTSC output is not of the highest quality, but it is adequate for personal and small-business applications. To obtain better results, you can bring your videotape to any video production house in your area.

Laser printer and plotter support for the Amiga is available in individual software packages. PageSetter, for example, lets you use the Postscript page-description language to access the graphics power of the Apple LaserWriter. CAD packages such as Aegis Draw Plus support plotters directly.

As with videotape, you can also photograph your Amiga screen yourself. For professional results, you can send your IFF picture files to ImageSet, 555 19th Street, San Francisco, CA 94107. They'll produce a 35mm slide of your IFF picture for about $10.■

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Dealer Inquiries Invited.

Circle 7 on Reader Service card.

Reviews

DeluxeVideo

Whether you make commercials for a living, or just fantasize about being the Steven Spielberg of video, DeluxeVideo is a star.

By Gary Ludwick

As the Creative Director of an advertising agency, I have long believed that the Amiga could do for Art Directors what the word processor has done for copywriters—eliminate the manual drudgery associated with layouts, open up creative possibilities and give the artist more flexibility and design opportunities.

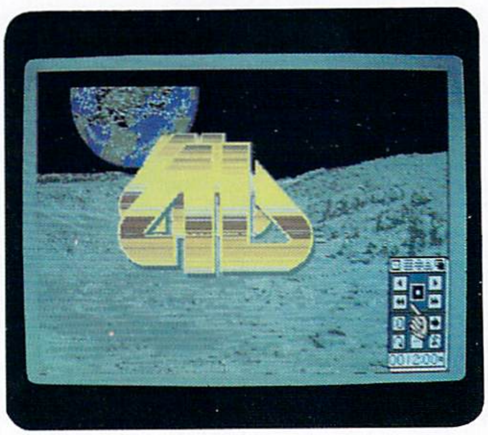
DeluxeVideo has begun to fulfill the Amiga's promise. An incredible piece of programming, the package makes use of almost all of the Amiga's capabilities: animation, music, voice, business graphics, type and more. While it is great fun for those who just want to play and experiment, DeluxeVideo really shines in a business/graphics environment.

Electronic Arts took a different tack to copy protection with the three-disk DeluxeVideo package. One of the disks is the "key" disk, known as the Maker, and is essential to creating any type of presentation. You back it up and use the copy for your working disk. However, the original disk must be available during boot-up. Once the program recognizes the original disk, and extracts the key, the main program will be loaded.

Completing the package are the Player and Parts/Utilities disks. As the name implies, the Player disk contains a "VCR" type program that, since it is not copy protected, allows you to create distribution disks for your video presentations. The Parts/Utilities component of the program contains a collection of video elements, such as pictures, backgrounds, sound, music and instruments that you can draw on in creating your own programs. In addition, it contains special utility programs that, among other things, create animated scenes from any IFF-compatible paint program art.

Screen Test

Because DeluxeVideo has so many options and controls, what would take three seconds to achieve on screen would take paragraphs to describe on paper. So I'll concentrate more on *what* DeluxeVideo can achieve rather than *how* it achieves it. Suffice to say for now, the authors have done a superb job of making DeluxeVideo easy and relatively intuitive. Coupled with two of the best users manuals I have seen, the program is not intimidating at all. You can be up, running and creating surprisingly sophisticated video presentations in less than an hour!



DeluxeVideo uses a hierarchical structure, moving from the general to the detailed through a series of layers. Think of it as multitrack recording. Each track contains different instruments, each playing its own score. When all the tracks are played together, the total piece of music is realized.

The highest layer in the hierarchy is the Video Script, the basic blueprint for the entire video. It consists of one video track and up to four others: background, foreground, control and music. The video track contains one or more Scenes—the next level down. Clicking on one of the scene icons reveals in detail the Scene Script. Like the Video Script, the Scene Script allows you to program—or storyboard—action and events in detail. Again, like the Video Script, the Scene Script contains up to eight tracks which further refine and detail the action.

Each track in the Scene Script contains icons that are called Effects. Clicking on these reveals one further layer of detail, Requesters. A desired effect might be a Wipe or a Fade. The Requester then allows you to specify what kind of Wipe or Fade, in which direction and for what length of time.

A time bar across the top of each level keeps all of these tracks, scenes and effects synchronized. As you add new elements, regardless of what level you are working at, a vertical line appears from that element to the time bar. This allows you to precisely regulate the appearance of any effect or scene in relation to effects or scenes you already have in place.

Each window or level also contains a script gauge, which monitors the amount of memory your scene or video is using up. If a project requires too much memory, you can chain scenes and videos together, allowing the program to call up the next unit from disk. Horizontal and vertical scroll bars are also available at each level.

Lights, Camera, Mouse!

When DeluxeVideo arrived, our agency was working on a presentation for a new televi- ►

the new MaxiPlan Plus...



it's making every other spreadsheet old fashioned!

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The MaxiPlan Plus Spreadsheet features:

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- Ranges or cells referenced by "Name" or cell numbers
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  - —Data base (Index, Find, Lookup)
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- Sort on any number of fields in any order
- Maintain up to 16 data bases per spreadsheet
- Create merge files for labels or form letters
- "Find" or "Lookup" any specific record or records

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MaxiPlan Plus™
$199.00
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Oxxi inc
1835-A/Dawns Way
Fullerton, CA 92631
(714) 999-6710



MaxiPlan
Named the best Amiga spreadsheet of 1986 for its outstanding mouse interfaces, unique pull-down menus and advanced speech capabilities.

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sion station in our area. We had a graphic representation of the station's channel number, 46, in DeluxePaint. DeluxeVideo offered us the chance to bring it to life.

DeluxeVideo works essentially on two levels: background and foreground. Background elements are full screen, no movement visual elements. Foreground objects are smaller elements that can be moved or manipulated. Each can carry its own palette of eight colors.

Our commercial had been created with a 32-color palette. The Utilities disk solved the problem with a program called Framer. It not only helps animate objects and DeluxePaint drawings, but contains a palette conversion program. With Framer running, we loaded our Channel 46 artwork from the DeluxePaint Lo-Res drawer. The program immediately told us we had too many colors and offered us three options: Best, Change Color or Current Palette. Best is the most commonly selected operation. DeluxeVideo looks at the artwork, decides which eight colors are used most frequently, and translates the palette as it loads the image to memory.

With the basic elements in place, we were ready to begin constructing our script. The first step was to load the background, the lunar landscape from Aegis Animator with Earth rising. Though a long list of Load options is available, we chose to fade up from black. Next we Fetched our 46 graphic from disk and during the load, sized it to 0% in both vertical and horizontal dimensions. Through other Effects requesters we placed it (invisibly at 0%) over the planet Earth.

Then, we directed that the graphic be moved to lower center screen, while simultaneously sizing up to 100% in both dimensions. This gave the effect of the 46 zooming up from the planet Earth to become full sized on the surface of the Moon. Simultaneously adding Video Echo produced a streak or tail behind the 46 as it zoomed up. Once the 46 came to rest, the streak behind it disappeared by catching up with the main graphic.

We faded up the station's call letters in polygon text, a small type block that can be treated like a foreground object. Unlike normal text, it is three dimensional and can be moved, rotated and sized. Polygon text doesn't provide a choice of type styles (fonts), but it does have special effects like shadowing, outline or italic. Plus it gives you various graphic effects that you can use as the shadow element, along with choices of color for both primary letter and shadow. By using the Text Line requester, we were able to write a longer string, the proposed station slogan, and gained full use of system fonts and type sizes.

DeluxeVideo makes it easy to accurately place or move things around the screen. Anytime you use an effect that involves moving, appearing or screen placement of any kind, a TV set icon in the requester allows you to preview the move and/or the final resting place of the image. By dragging the foreground object around the scene to its final position, you teach DeluxeVideo what you want it to do.

The last bit of polish on our commercial was music. The Parts/Utilities Disk contained an electronic version of the theme from *2001, A Space Odyssey* (also known as the introduction to *Thus Spake Zarathustra* by Richard Strauss). Adding it was as simple as going back to the Video Script, dragging down a new track, selecting Music and calling for 2001 to be loaded. Other digitized sound and sound effects can be imported from any source as long as it meets the SMUS standard with INSI chunks that describe the instruments needed. DeluxeVideo also can accept input from various digital recorders, Genlock inputs and digitized video and frame grabbers.

A Preponderance of Possibilities

DeluxeVideo has an abundance of capabilities and features, some of which we can only touch on here. Utilities like Vidcheck both compress videos for efficient disk use and allow you to print out hard copies of your video scripts. With the dissembler, you can even take apart existing videos and move parts to new productions. DeluxeVideo's Scene Generators are automatic programs-within-a-program that produce animated sequences of three-dimensional bar and pie charts. Supply the data, and DeluxeVideo proportions the charts or graphs to the correct percentages, applies the labels you've typed in, and delivers a complete animated sequence with pie wedges flying in from off screen or bar charts growing to size. You use the same technique to create Credits sequences. Once finished, a video may be shown on the Amiga or dumped to videotape. The necessary connections are explained in the program's manual.

DeluxeVideo's documentation almost deserves a review of its own. The basic volume describes everything you need to produce first class videos in a minimum of time, without bogging down in technical details. The advanced volume, which you receive after you return your registration card, goes much deeper into the fine points of DeluxeVideo.

The only problem I found with the program was in making repetitive edits. With the mouse, you can get ahead of the program, which is constantly redrawing the screen to reflect the changes, and cause DeluxeVideo to lock-up. The only way out is to lose all your work with a warm boot. If the program designers had put the cursor to sleep while the program was otherwise occupied, DeluxeVideo would be as bulletproof as it is flexible.

That's A Wrap!

DeluxeVideo is an extraordinary piece of programming. It has the power to do things that just three years ago would have cost you $150,000 to accomplish. The package brings together under one roof almost every capability built into the Amiga. It's the biggest $99 bargain the world of computing has ever seen.

DeluxeVideo
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
415/571-7171
$99.95
512K required.

(Editor's Note: The biggest bargain just got bigger with the release of DeluxeVideo 1.2. Aimed at making the package more of a professional's tool, Overscan extends an image to the screen edges, eliminating the previously omnipresent grey border. The extended memory supports a larger parts pool and larger instrument sizes, even the 40K instruments from DeluxeMusic Construction Set. Other changes include faster and smoother polygon text movement, six new wipes and scene generators and support of the interlace mode.)

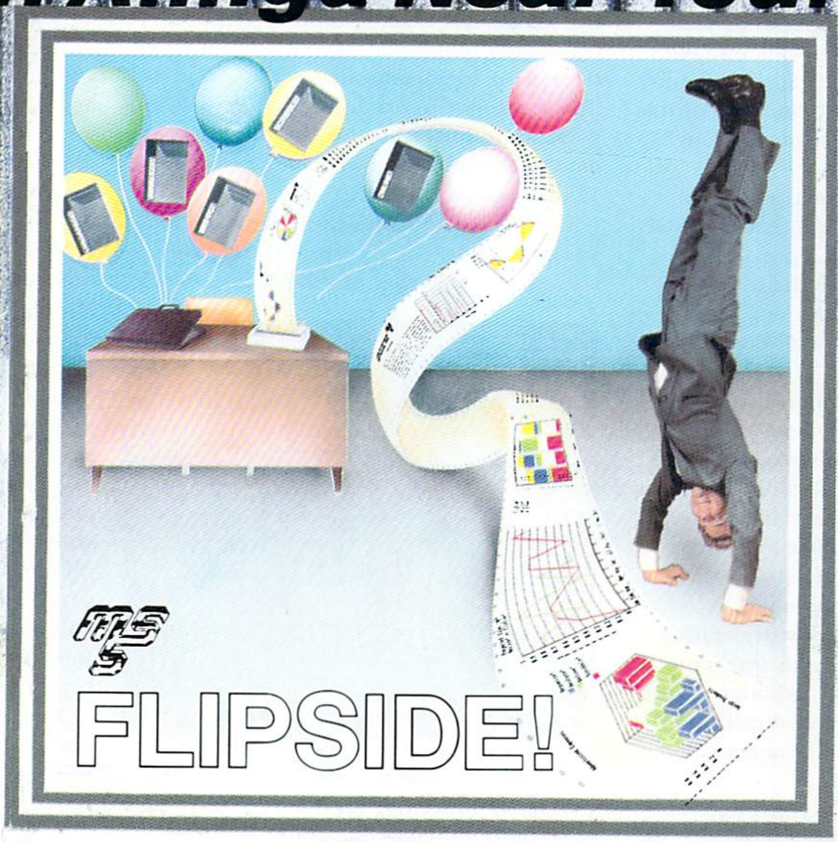
MaxiPlan

Successfully incorporating all the bells and whistles found in previous spreadsheet programs, MaxiPlan is well matched to the Amiga's unique nuances.

By Al Willen

Computer experts agree that best-selling Lotus 1-2-3 helped make the IBM PC the dominant personal computer for business. ►

Now Appearing On An Amiga Near You!



Compatible with most printers, FLIPSIDE! allows your printer to **print any text file or IFF graphic picture extremely wide, all at once, on one long continuous page.** You can now make spreadsheet columns as wide as you want, create quality printouts for your college reports, office needs or home use without glue, tape or staples. FLIPSIDE! aids in the width and length design of just about any printout, from most IFF graphic or text file programs. FLIPSIDE!, requiring 512k is **easy to learn** and interfaces with Micro-Systems Software's other great Commodore Amiga programs such as Scribble!, Analyze! and Organize! FLIPSIDE! will also perform its print magic on just about any other word processor, spreadsheet, information manager or IFF graphic program. Ask for a dealer demonstration of these fine products, or call Micro-Systems Software, Inc. for more information.

Analyze!, a powerful electronic spreadsheet, with extensive mathematical functions, a full featured macro language, graphs and sort, allows you to enter mathematical data from your company's general ledger and bank reconciliations to your personal budget and check registers. When using Analyze! with FLIPSIDE!, you can print extremely wide and impressive spreadsheets.



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Quite frankly, Maxiplan from Maxisoft overpowers Lotus in both processing and ease of use. To say that non-copy protected MaxiPlan is user-friendly is an understatement. Probably 80 percent of all available options can be run by a spreadsheet-familiar user within the first session. Most of the rest can be mastered after a once-through of the manual.

Upon loading the program, a Control Window will open. You then choose to start a new worksheet, open up a previously saved worksheet, enter into the four-color standard mode or eight-color enhanced mode or open and close Workbench from within MaxiPlan.

The first line of a worksheet contains system information such as type of color mode and memory used versus memory left. The worksheet's title is on the second line, while the third displays the active cell's location by row and column as well as mouse-driven formula entry buttons which direct various numerical and arithmetic symbols to the Contents line below. A temporary editing buffer, the Contents line holds text, number constants or mathematical formulas prior to being deposited into a selected cell. The maximum spreadsheet is 512 alpha columns by 16,384 numerical rows.

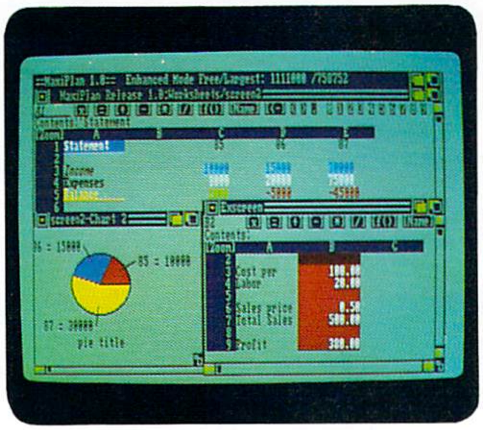
How To Get There From Here

Moving around MaxiPlan is easy. You can use traditional cursor keys or Wordstar equivalents, your mouse, direct keyboard commands or the Zoom mode. For direct command movement, go into the Command mode and choose the Select option. You then can move to a block of previously defined cells, the last cell used, the active cell or a specific location defined by column/row or a label name. For an aerial view of the entire worksheet section, click on the Zoom gadget. It not only allows you to move quickly around vast expanses of the worksheet, but it highlights through the use of color, each cell's data type.

There are seven pull-down modes of control in a spreadsheet. An optional Macro program is available for $25 or in the recently released MaxiPlan Plus, which also contains a terminal emulator.

In the Project mode you can open up to six overlapping worksheets, access previously stored worksheets, save the current worksheet, direct the worksheet to either a word processor disk file or to a printer, open/close Workbench options, and check worksheet status. The file selector menus are cleanly organized for both directory show/allocate control and for file directed output. External, hard and RAM disks are all fully supported. The Print Setup option collaborates with your Preferences printing file to produce exactly formatted color or black-and-white hardcopies. A helpful feature of the logic-controlled print option allows even narrow carriage machines to print wide spreadsheets by outputting the data in carefully interrelated 8½-inch by 11-inch panels.

Using the commands in the Edit mode you can delete, copy, paste and clear the contents of cells, define a name for a block



of cells and delete cell names. Most of the options in this mode are variations of standard Intuition edit commands. However, you can name an entire group of cells for even easier spreadsheet movement.

The Format mode determines how cells are displayed. For example, what degree of decimal accuracy do you wish? How about options that pick and modify up to eight pen colors in enhanced color mode? Should commas and dollar signs be automatically displayed? How wide should the column be and in what graphic style? Should the cell be protected from possible erasure and overstriking?

The Options mode gives you an even greater control over your spreadsheet. Whereas Lotus will only display the numerical outcome of a formula, MaxiPlan offers a choice between the result and the mathematical formula itself. For those more comfortable with Wordstar keyboard commands, a toggle is included. Freeze Titles remembers column or row headings while you scroll through long spreadsheets. A talking option reads aloud the up to five-line cellular documentation notes, while Keyboard Echo verbally repeats your input as your type. Finally, there's a Display Grid toggle for people like me who like to see the boundries of the cells.

The Commands mode handles cell movement, documentation and calculation functions. Unlike simple cut commands, Insert and Delete row/column automatically compensate formulas based on specific cell locations. The Fill command copies information within a source range into a target range, adjusting all formulas to their new locations.

Three additional features make MaxiPlan especially useful. With the Chart option you can choose a bar, line, pie or area graph to represent up to four rows and a variable number of columns of your spreadsheet. Multiple charts may be opened at the same time and independently resized, directed to a color printer or sent to an IFF graphics program for enhanced detailing. Best of all, each chart may be dynamically linked to your spreadsheet, so altering a spreadsheet cell will instantly change the corresponding graphic. With the Paste command you use your mouse to access 59 built-in mathematical and Boolean functions. Click on a desired operation and it will be sent to the edit buffer as if you had typed it. In the Read Range mode, your Amiga will verbally repeat an entire range of data back to you so that you can easily check it against a hardcopy data sheet. It's like having a personal secretary sitting on the end of your desk.

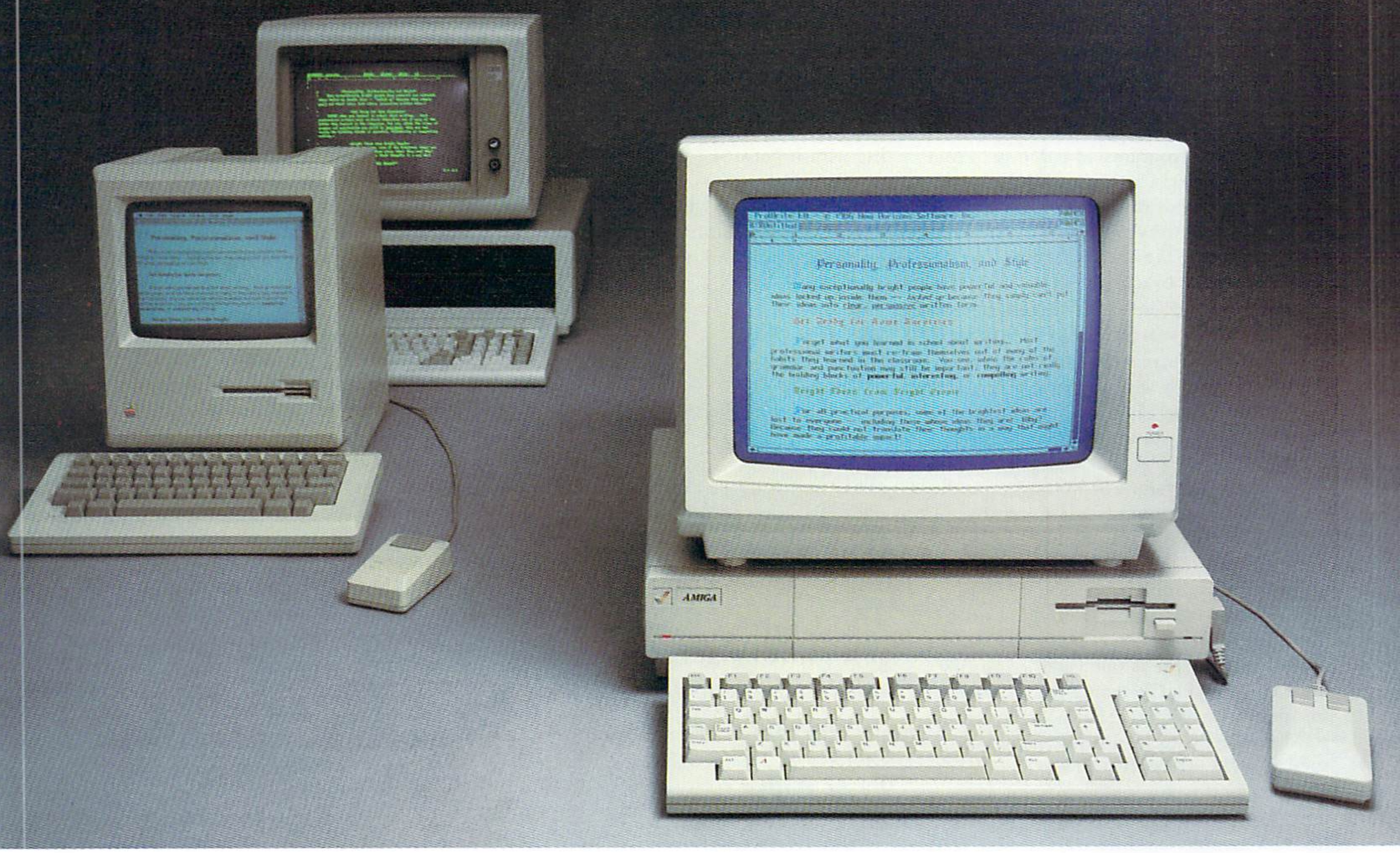
From Boardroom To Ballfield

The Data mode transforms your spreadsheet into a competent visual database. You can selectively sort, copy, extract and delete a specific block of cells into a target range. You can also save your data as a text file to be used in a word processor. Although I wouldn't buy MaxiPlan specifically for its database qualities, I must admit that this feature is fantastic and has wide applications, especially when used with the program's spreadsheet components.

For example, the manager of a baseball team could set up three spreadsheet databases—one with the name and vital statistics of all his players, one with the effectiveness of the team for that season and one with results for all the teams in his league. Since more than one spreadsheet can exist at the same time in a large RAM system, he could paste cells from one spreadsheet to another, and have the database options create a sub-spreadsheet database, perhaps ranking players by their batting averages.

MaxiPlan supports a number of built-in functions ranging from a simple SUM to the numerically complicated DVAR, which automatically determines the population ▶

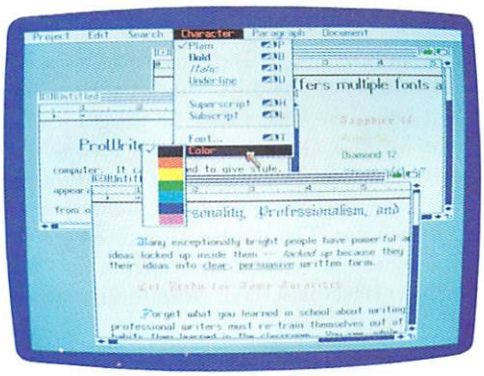
Now Look At Word Processing In A Whole New Light.



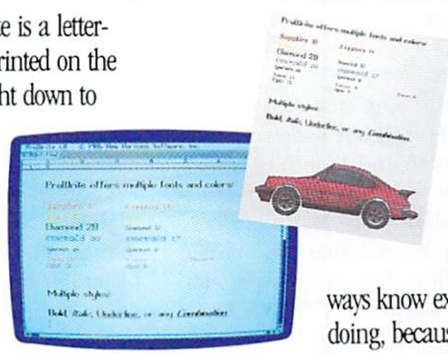
ProWrite.™ All Others Pale By Comparison.

You chose Amiga® because you wanted something more. Now you choose your software for the same reason. Which makes choosing ProWrite word processing a very bright idea.

The Full Spectrum of Capabilities. ProWrite lets you select more than just a typeface: You get proportionally spaced character fonts. Brilliant color. Unsurpassed graphics capabilities. And no surprises. Because what you see on the screen with ProWrite is a letter-perfect picture of what you'll see printed on the page— from header to footer, right down to the last pixel.



Creative Control: A Brilliant Stroke. With six pull-down menus, just a click of the mouse or a few keystrokes is all you need to create, delete, copy, alter, move and otherwise manipulate text. Multiple selections create a limitless choice of character fonts, colors, sizes and styles. Customize everything from a daily diary to an annual report, including color graphics. And with headers and footers always clearly displayed, ProWrite makes even advanced formatting as easy as dragging a mouse.



Ease of Use: Another Bright Idea. ProWrite delivers more of what you bought Amiga for: Professional output. Multi-tasking power. A "creative edge." You can open up to eight windows at once—and perform a variety of editing tasks between them. With ProWrite, you'll always know exactly what you're doing, because you see it done—in living color—right before your eyes.

See for yourself what you get with ProWrite. Then, just for fun, take a look at the others—and watch them pale by comparison.

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New Horizons Software, Inc. PO Box 43167, Austin, TX 78745 (512) 329-6215

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variance of values in a specified range. There are also lookup functions that load table values into your spreadsheet according to Boolean conditions. Auxiliary functions will display a cell in green if it contains a profit. If a cell contains a debit, it is displayed in red and repeated verbally.

The MaxiPlan Utility drawer contains three support programs, MaxiMerge, From 123 and MaxiSet, a voice customizer. MaxiMerge blends data from your MaxiPlan database into letters created with a word processor. Type the document into the word processor, bracketing the variable data in a double set of less-than and greater-than symbols, and save it as an ASCII file. Save the database information corresponding to the variable fields with the Save Data As Text option. After entering MaxiMerge, use pull-down menus to input the names of both documents and click GO. Due to a glitch in early versions of the software, the system may crash unless you direct the merged file to disk, and then send it to the printer. Version 1.5 and MaxiPlan Plus have corrected this problem.

From 123 translates a Lotus 1-2-3 worksheet made on an IBM PC into a MaxiPlan spreadsheet. There is one catch—you first must convert the file from MS DOS format to AmigaDOS format. The most straightforward method is to let a utility program, such as DOS 2 DOS by Central Coast Software, make the conversion for you. If you have a modem you can upload the Lotus file to a commercial BBS with storage facilities, then download it to your Amiga. I used the PC utility commands on the Workbench 1.2 Extras disk and made the conversion in less than five minutes.

Fill In The Blanks

For the most part the bugs in MaxiPlan are minor. The vertical-scroll bar only rolls from row one to 2,048 and then hangs up in Kickstart 1.1, but works fine in version 1.2. My main complaint with MaxiPlan is the documentation. It's not that the manual isn't well written—it is. It is also sorely incomplete. Imagine buying a 2,000 page history book titled *The Complete History Of The World* and discovering on page number 1,999 that the author is still discussing the Roman Empire. Suddenly, by the end of the next page it's the nuclear age. That's the kind of impression I got when reading the MaxiPlan manual.

Specifically, the documentation lacks sufficient explanation of the various built-in functions. MaxiSoft should provide additional examples and illustrations to drive home critical points. However, the Help screens on each level and example programs offer comprehensive on-line command documentation. With Help screens this informative, you almost don't need to refer to the manual.

MaxiPlan is a well thought out spreadsheet application program. I enjoyed working with it because it was not only more powerful than Lotus 1-2-3 but it was extremely easy to use. I have no doubts that MaxiPlan will establish the Amiga as a powerful competitor in the business world.

MaxiPlan
MaxiSoft
2817 Sloat Rd.
Pebble Beach, CA 93953
800/942-6294
(Distributed by Electronics Arts)
$150.00
512K required.

Datamat A-200

This database applications generator makes even intricate relational situations viable—at a reasonable cost.

By Al Willen

With the exception of dBaseII/III, most personal computer data structures lock you into using the program's preconceived notion of how the database and its various fields should interact. Armed with Datamat A-200 by Transtime Technologies, you can create a myriad of database applications, each capable of performing its own specialized function, and linking together in a network.

I consider the program to be more of a high-level artificial intelligence language than a database. Datamat A-200 doesn't simply store data as passive character strings. As an operating environment, the program allows you to create application programs that perform detailed calculations on numerical data, execute multilevel intelligent sorts, perform search and value judgement procedures, interact dynamically with other databases and present output in completely user-defined formats.

The Foundation

The cornerstone of the program is the Dictionary file. Housing user-defined field names, the Dictionary file is paired directly to the inputted data, or field values, held in a separate data file. Take the commonplace Basic programming statement, LET X = 5. The field name, X, would be stored in the Dictionary file, while the field value, 5, stored in the Data file. Using this method, you can apply the same variable names to different sets of data, creating a versatile database template.

Datamat A-200 has a data default form for input and output, but the program also allows you to easily create, via two internal text editors or any word processor, Form files which present your data in a structured manner. In other words, you can design a special data entry structure, then create multiple forms which utilize all or part of the information previously entered. Forms can contain text material, the contents of any data field, calculated values from other data fields, or system global variables. An RPG file contains input areas for FRM textual files.

A Formula file contains user-defined formulas that act on the various numerical data fields as established within the Data files. Twelve mathematical operators and 14 built-in functions alter or create new data fields based upon the mathematical results. You can also specify the priority of calculations and link numerical fields from different types of databases to create new numerical fields.

The System Link file further expands your power by coordinating up to ten individual links to other databases from the active base. These links can be numerical or textual. A tree-like UNIX hierarchy—a true relational database—is easily set up.

The last file supported by Datamat A-200 is the Menu file, which allows a programmer to create user-friendly applications menus for subsequent end-operators. Keys F1 and F6 are used respectively for pop-up choice screens and hardcopies of most screens.

Once inside, Datamat A-200's Dictionary and Form modules handle application program creation, while Data Entry, Retrieve and Analyze use the finished database within the operating system. Each facet corresponds to one of Datamat A-200's five main functions and its support subroutines. Not being an Amiga specific program, Datamat A-200 is almost completely menu-driven and looks exactly as it would on an MS-DOS machine. Pull-down menus are non-existent. The mouse is used only to highlight and select a choice from an F1 pop-up selector screen. Despite this rather ▶

bland way of interfacing, I found it easier to use my keyboard to move around than my mouse.

The Ground Floor

The first step in building a custom-designed database is the Dictionary mode. To create a new dictionary you must specify a unique name and a Data file to which the dictionary will be linked. The date, an optional password to limit access, the author's name, a short description for the dictionary and a dictionary list/hide security option are also required.

You have eight options for defining your new dictionary, such as adding or modifying a new field, specifing formula fields and copying fields from other dictionaries. As always, you must specify which dictionary is active before using any subroutine. To do so, either supply the number that Datamat A-200 has assigned to the Dictionary/Data file pair, press the enter key and name the dictionary or press the F1 key for a screen of available choices.

When you create new fields, you must assign each one to a group numbered zero to 127. This grouping, like a directory in AmigaDOS, helps categorize similar fields together. While assigning a field in group 66 rather than group six doesn't affect the search capabilities of Datamat, group zero is termed the Key Group and is used for fields that can uniquely identify a record for automatic sort functions.

After you specify the group number, you enter one of the most important sections in Datamat A-200. The Field Definition Screen firmly establishes the field's type as text, logical or numerical and its size. It also initializes optional default values for that field, and molds optional end-user response parameters.

Form creation uses straightforward editing commands. In case of doubt, press CTRL-W for a help menu. You can incorporate textual material, field values, global variables, text from other outside word processor documents and picture files from IFF graphics programs. Besides creating new forms, the Form module modifies, deletes and lists existing forms. Once inside, you can export and import forms to and from any word processor, check imported documents for syntax errors and activate a system commands option.

The Data Entry module allows the end-user to fill the fields within a record or mass edit existing records. Data entry can be done on a specific or record basis. Because of the independence of various modules and subsections, you can assign security passwords for many levels of the database to limit access.

The Retreive module allows Datamat A-200 to display records containing values that meet established search or sort criteria. You can retrieve information based on fields contained within the Key Group, or within any group one through 127 in your file. You can use very complex AI and Boolean criteria to pinpoint on material or you can sort records in ascending and descending order based on a selected field. Datamat A-200 will even perform simple statistical analysis on specific records.

Criteria is determined in an Output Format screen after specifying the output form, the group number and the field names used for the search. Record ranges, increment values and output device are also specified. You next enter a Conditions screen where you define the individual facets of your search and in what order they should be tested. Limited pattern matching with a wildcard is possible.

The Analyze mode performs detailed examinations of your database. You start off by specifying the Dictionary/Data file pair, search criteria and the type of analysis you wish to perform. The Statistics function calculates mean, variance, standard deviation, standard error frequency, minimum, maximum, mean and total frequency. X-Y Plot displays a graph of your data. Histogram plots bar graphs with up to four subsets of records. Regression performs up to a 20-field regression analysis of your data.

Finishing Touches

When you purchase Datamat A-200, you'll also get a number of extras. Automatic Procedures is a type of macro capability that remembers your programming procedures. This feature is great for quickly recreating a program structure for another computer system, or creating a tutorial or training simulator for end-users. The ready-to-use database structure is helpful on two levels, as a phone directory and mail merge and as an example of how a phone directory/mail merge applications program can be set up using the Dictionary and Form modules.

Considering the spartan 8½- by 11-inch, 264-page manual that is included, the most welcome bonus is a tutorial file. But conventions used in the manual and program are often confusing and contradictory. Fortunately, Transtime Technologies has set up a toll-free number to help customers.

Datamat A-200 is an extremely complex and convoluted program because it is a tool for making tools. Datamat is extremely powerful, but it lacks any semblance of user friendliness. Learning the program is often a trial-and-effort process involving lots of human errors. Datamat A-200 doesn't tolerate mistakes. While the program will send you off in an infinite loop as punishment, it won't tell you what you did to get there.

Another concern came up when I tried to alter some of the peripheral parameters. I could not figure out a way to access my external 5¼-inch DF2: drive. I also tried to change the printer preference to my non-standard Canon PJ1080A. But the printer directory, usually found in the DEVS directory, was missing entirely.

Feeling At Home

You shouldn't touch Datamat A-200 with even a 100-foot mouse cord unless you have a solid background in database management and programming. There are easier database programs for beginners, including Transtime's Datamat A-100, which is Amiga-specific. On a difficulty scale where Notepad is one, DeluxePaint three, and a machine code assembler is 10, Datamat A-200 would rate eight. Professional programmers will especially like Datamat A-200 because it will allow them to create highly complex database programs, which can be modified later without complex coding.

Datamat A-200
Transtime Technologies Corporation
810 Sheridan Dr.
Tonawanda, NY 14150
716/874-2010
$249.95
No special requirements.

Update

DeluxePaint II

Now you can be willful, spontaneous and care-free, rather than bothered with program mechanics.

By Roger Goode

When DeluxePaint (reviewed March/April 1986) was first introduced, I was delighted ►

to find a program that could take the amazing graphics capabilities of the Amiga and really put them to use. I have long felt that DeluxePaint is the best program an Amiga owner could find. But, I'm prejudiced. I'm an artist. Now DeluxePaint II is pushing those same capabilities to their limits.

Not Just a Paintbox

Upon opening up DeluxePaint II, you encounter the new screen formatting requester window, designed to make life easier in basic disk and program operations. The requester allows you to choose, at any time, the resolution and, based on that, the number of colors you want to use. Unlike the earlier version, you never have to leave the program to change resolutions.

The other new operational-type features are just as attractive. With the page-sizing requester, you can set up a screen anywhere from 320 × 200 pixels to 1,008 × 1,008 pixels, depending on how much memory you have available. The screen scrolls vertically and horizontally to reveal a section at a time, or you can view the whole picture at once using the Show Page command under the Picture menu. When you choose to print a picture, a requester allows you to pick options for printing each picture without having to reset Preferences beforehand. The new Delete command frees precious memory space by tossing out unwanted pictures and brushes. I find this a real boon, since I can see what I'm disposing of as I'm doing it.

Some small additions that should make a lot of people happy are the DF0:, DF1: and HD: gadgets at the bottom of the load and save requesters. While switching from drive to drive by toggling may not seem like much, it's just this kind of thoughtful programming that lets you forget about the mechanics of what you're doing and just do it. And, it makes things so much easier if you're lazy like me.

A New Bag of Tricks

Although the package boasts over a dozen new features, three stand out from the rest—Stencil, Background and Perspective, found under the new menu item, Effects. Even if you're a veteren DeluxePainter, you'll wonder how you ever got along without them.

The Stencil effect works something like a frisket used by a retoucher or airbrush artist. It allows you to mask off a section of the picture so that you can paint freely around or over it without altering the masked area. The Amiga locks the colors on your palette that make up the masked parts of the painting. To create a stencil you can either select the colors you want to mask, or the colors you want to paint over, whichever is easier. To make it simpler still, you can pick the colors to be locked right from the picture onscreen. Once your stencil is set up, continue to paint as normal. You'll notice that whatever brush you're using only appears in the areas not locked off by the stencil. As you move your brush around it will seem to slide behind the locked colors. Naturally, it will only print color in the areas that are unmasked.

The Background effect operates similarly to Stencil. You may lock, or fix, the entire picture currently onscreen, then continue to paint over the fixed original. If you don't like what you've added, just click on CLR in



the toolbox and all the changes will vanish, leaving the fixed picture intact. If you're happy with the results, you can pick up a brush from the reworked area, without picking up any part of the original.

The most exciting new feature is Perspective. I'm not quite sure what I can say about this in less than four or five pages, other than that it's fantastic. Simply put, Perspective lets you rotate any custom brush you've made around its x, y and z axes, and then print it in relation to a perspective center, or vanishing point that you've placed on the screen.

Let's say you've painted a small portrait and picked it up as a custom brush. Once you've picked up your brush, you operate Perspective through a combination of keyboard and keypad commands. Depending upon how you've placed your perspective center, rotated the brush and placed it in relation to the center, you can produce a number of effects. You can print a series of portraits starting as a tiny dot near the perspective center and growing larger and larger as they come toward you. Or, you can print one large portrait that seems to be laying on its back and tapering toward the vanishing point. Some of the effects you could create with this might be a row of buildings shrinking back into the distance, or a fleet of starships swarming out from the depths of space. The possibilities seem to be endless and, if you're ambitious, you can create some pretty sophistcated graphics.

Nothing Up This Sleeve Either

In the toolbox, you can now choose gradient, pattern or solid color for the color fill and each of the filled shape tools. With Gradient Fill you can use a shade range on the palette to fill a shape in gradations of color from top-to-bottom, side-to-side or following the contour of the shape. A slide bar adjusts how smooth the gradation is, or the dither. Pattern Fill lets you color a shape with a repeating pattern taken from the current custom brush.

The straight- and curved-line drawing tools both allow you to draw with a spaced line. You can select either the number of dots in a line, or the number of pixels between the dots. This control, as well as the control for the Grid tool, allows for entering the exact number of pixels you want in each space.

Clicking the left mouse button twice on the custom-brush selection tool corrals a brush in much the same way you draw a shape with the Make Polygon tool. And finally, there's a really fun addition to the Prefs menu, Multicycle. With Multicycle on, you can paint with a multicolored brush in the Cycle Draw mode, and *every* color in the brush will cycle independently, making for some spectacular effects.

A Tight Fit

DeluxePaint II is so jam-packed with information that even with 512K there isn't a lot of elbow room left over to operate in. There's more than enough space for all the normal routines, but if you want to work in hi-res, say, or use a couple of the special features simultaneously. . .well, you're probably out of luck. For example, if you try to use the Fix Background function, but are already using your Spare Screen as a clip-art page, you'll push the program over its memory limit. To get around this, you can delete the spare screen entirely and free its memory space. However, you'll also lose all that clip art and the easy availability that made it so valuable.

Most solutions for short-memory problems require inordinate amounts of jug- ►

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gling and frustration. The best answer and, unfortunately most expensive, is to purchase some kind of memory expansion for your Amiga.

The only other drawback worth mentioning is the Electronic Arts' software-protection scheme. The original program disk is the key disk. Make as many copies of DeluxePaint II as you like, but each time you want to use the program you must also insert the key disk, which often means shuffling through a pile of frequently-used disks. It becomes a minor pain. This too can be remedied by a trip to the bank. For an additional $20, Electronic Arts will provide you with an unprotected disk.

Overall, DeluxePaint II promises to take over the position of my favorite program for the Amiga. Its ease of use and multitude of special functions set it far and away above any of the other graphics programs I've used. In fact, on the strength of its potential alone, I'm planning to invest in memory expansion for my Amiga. It'll be well worth it, I'm sure.

DeluxePaint II
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
415/571-7171
$130.00
Kickstart 1.2 and 512K required.

(See What's New? (p .89) for details on Electronic Arts' upgrade policy.)

PageSetter

While it isn't powerful enough to put AmigaWorld *out of business, this desktop publishing system could spark a lot of competition.*

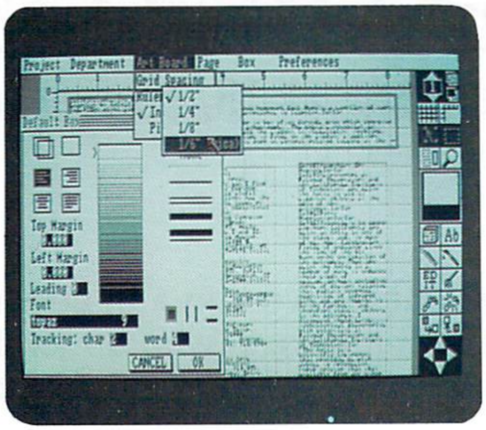
By Gary Ludwick

Desktop publishing is the new computer buzzword. Most of the attention has been focused on the Macintosh and laser printers. Now it's the Amiga's turn with PageSetter, which doesn't need a single add-on to turn out some impressive results. Don't turn the page just because you don't wear a green eyeshade and publish a newsletter. A program like PageSetter is extremely useful for anyone who deals with words and graphics—advertising agencies, college students, engineers, corporate managers.

A large, unprotected program, PageSetter contains all the tools you would normally find in any publishing operation. It has a resident text editor to generate copy and a graphics editor to load existing graphics or create and manipulate original graphics. In addition, you'll find page layout tools such as rules, margins, grinds and backgrounds. PageSetter even has its own press room operation that wrings impressive results out of lowly dot-matrix printers.

The Copy Department

PageSetter's text editor contains basic moving and editing controls such as block move, find and replace, cut and paste, mark and exchange, but lacks the screen display and formatting frills of commercial word processors. Because PageSetter itself is a dedicated page formatter, it would be redundant to include those capabilities in its own text editor. PageSetter will import Textcraft and Scribble! files, and translate imbedded formatting commands into its own formatting structure. Imported text from other word processors will display imbedded commands as text that will have to be edited out and replaced.



The text commands deal with printer output and special typeface features. PageSetter's press uses eight imbedded commands—bold, italics, underline, outline, shadow, reverse, plain and soft hyphen. Each of these has an on and off toggle. The command, a reverse slash and letter combination, brackets the material you want enhanced. Once you create a text file, you can save it to disk or keep it in a special Paste buffer to later apply to your page layout.

Unfortunately, the text editor is line, rather than screen oriented. Once you've filled the screen with text, the program rewrites the entire screen every time you add another line, instead of just scrolling every line up. It does have a type-ahead buffer, and catches up after it has rewritten the screen. As a fairly fast typist, however, it was disconcerting to me always to be half a line ahead of the display.

The Art Department

Like its partner the text editor, the PageSetter graphics editor is rudimentary by comparison with most similar programs. Drawing tools include freehand or smooth, dot, line, rectangle and ellipse draw. You also have airbrush, fill, magnify, text and a small assortment of dot brushes. Your color control consists of a toggle switch for black or white.

Simple controls do not necessarily lead to crude drawings. PageSetter's graphic program works in a mode of 640 x 200 pixels. The ratio was chosen to provide as close to a one-to-one correlation between screen and printer as possible, eliminating that squeezed look common to printouts from other paint programs. PageSetter *will* load any IFF compatible file, but when you reduce a 32-color palette to two, the results are unpredictable at best. But if you do get full-color artwork to translate well, PageSetter provides a special 5:4 ratio that allows the art to print out with minimal distortion. The graphics program also provides coordinates and sizing controls so that artwork can be proportioned to fit your page layout.

Power Publishing

Once you have the words and the pictures, you're ready to design and lay out a page. With the pull-down Create New Page menu, you can create the blank page and define its dimensions. The menu is preprogrammed for an 8½ × 11 page with one-inch margin on the top, right and bottom, and 1½ inches on the left. There should be some way to permanently change these default settings, but there isn't. For example, to get one-inch margins on all four sides you must manually change the dimensions on every page you create.

The next step is to decide the size and number of columns on your page. It would be so easy to define how many columns you desire on a page, and then have the program automatically compute the width of each column for you, taking into account your page width and margin sizes. But no! You have to figure out how many columns ►

you want and specify the width. If you make a mistake in your mental math, PageSetter just ignores your input until you get it right. In my opinion, this is needless work and frustration.

Page layout by column is a standard method of formatting, but it's not the only way. Think of magazine and newspaper pages as a series of boxes. A column is simply a box without lines or rules surrounding it. That's how PageSetter works—every element of your page is a box, even the columns. Your headlines go into defined boxes as do your illustrations, captions, subheads and text.

Begin laying out your page by drawing boxes onto the blank paper. To help you maintain some symmetry, PageSetter allows you to put ruler or grid overlays on your blank page. Using another pull-down requester, you then define the characteristics of a particular box, such as type style and size. Do you want a shaded background or rules around the box? How do you want your type formatted when it is put into the box? PageSetter offers four styles of type formatting, left, right, center and micro justification which allows you to precisely determine letter and word spacing.

The Hard Part Made Easy

With your page laid out, you are ready to paste the elements into the boxes. While a small story may fit into a single one-column box, a large story may take up the whole page. PageSetter allows you to chain boxes together for that long story. When you paste down your text it automatically is continued from one box to the next.

For headlines and captions, simply create a box where you want the headline to go and click on the Quick Text icon from the on-screen menu. You can enter up to 100 characters, then use the Pen icon to paste the headline into your box.

Graphics are handled the same way as type. You either create them or call them onto a screen in the Graphics Department and crop them the way you want. Exit to your page layout and pick up the brush icon, clicking it into the box where you wish the graphic to appear. Once inside the box, you can still move and resize your artwork.

The chances are good that everything isn't going to paste in perfectly the first time. No problem. Even after the type and graphics are in place, you can resize your boxes, move them around and change their characteristics. For anyone who's ever had to do page layout manually and found themselves wishing for type vices or column expanders, it's like dying and going to heaven!

Roll The Presses!

You've fiddled and you've fudged, and you've finally gotten the page set. It's time to go to press. PageSetter reads your Preferences file to determine your printer specifications, then adjusts itself to comply. Any printer within Preferences will work, however the manual recommends the Epson 80 series of printers.

To put it mildly, I was amazed at the quality that came out of my faithful old Epson! With a new printer ribbon, PageSetter can produce surprisingly close to laserwriter quality. The output isn't a perfect copy, but for me the difference isn't worth the expense of a laserwriter for probably 80-percent of the program's applications. However, if you have access to a laser printer, drivers for PageSetter should be out sometime in the spring.

Because the Epson is working in its bit-graphics mode, output is slow—approximately three to five minutes per page. To speed things up in the next release, Gold Disk should provide logic seeking in the print process. In other words, teach the program to provide a linefeed for every blank line. Right now the printhead travels the full length of the carriage even when there is nothing to be printed. Logic seeking could halve the print time on documents with a fair amount of white space.

The Weak Link

PageSetter is a powerful first entry in desktop publishing for the Amiga. Ironically, its documentation doesn't live up to the product. Without an index, finding answers or topics is very time consuming. I initially spent 45 minutes trying to find out how to resize a box. Illustrations are also lacking. The onscreen icon menu is very specialized and somewhat vague, and the manual contains only one explanatory illustration of it. As I read the documentation and worked the tutorial, I was constantly having to flip back. Key illustrations should be repeated whenever they are necessary to understanding the program, or a quick reference card of icon symbols and key controls should be provided. Finally, the type is too small. The writing is clear and the tutorial helpful, but you may go cross-eyed reading it.

PageSetter is an excellent way for any Amiga owner to break into desktop publishing. The price/value relationship here is very high, particularly when you consider what Macintosh owners are paying for often less powerful products. Yes, PageSetter has some faults, but they tend to be irksome rather than serious. More important are the opportunties provided for upgrading and extending the system.

So, despite some rough edges, PageSetter is a very worthwhile program that can be put to use by a wide segment of the Amiga population. It would have driven Citizen Kane crazy!

PageSetter
The Gold Disk
PO Box 789
Streetsville, Ontario, Canada L5M 2C2
416/828-0913
$149.95
512K required.

Professional Text Engine

Though the manual may need a tune-up, this high-powered engine is revved up and ready to edit.

By Douglas Watt

Professional Text Engine, from Zirkonics Corporation, is aptly named. A professional piece of work, it is not a program for the casual Textcraft user looking for ease of use above enhanced capabilities. Its size and strength make it an engine suited to the serious C programmer. It can be configured to perform virtually any function, although programming it is hardly a simple task. In exchange for some complexity and difficulty, you are rewarded with power and flexibility. If you are willing to work, you can probably even turn it into a spreadsheet of sorts. It comes with several built-in optional modes, including some specifically designed to work with assembler code and C. A WordStar emulator copies the basic IBM screen and cursor control functions accurately.

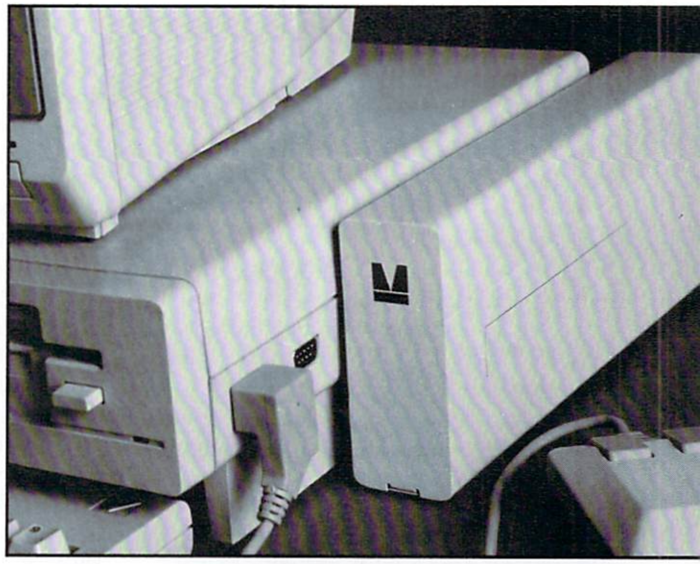
For a demonstration of the differences between text editing and word processing, just try to print or reformat several pages with an editor. You'll soon be begging for your old Smith Corona back. PTE poses the same problems. Fairly simple editing functions, such as inserting text, are rather difficult since you are forced to manually reformat each paragraph afterwards. To do ►

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Zero Wait States
User Expandable from 512k to 2 Megabytes
Bus Pass-Through
MultiFunction Option: battery/ clock, FPU, parity, Sticky-Disk



It's small, but it's BIG–

Since most of you want to expand your Amiga's memory without having to also expand your computer table, we designed **StarBoard2** and its two optional "daughterboards" to fit into a sleek, unobtrusive Amiga-styled case that snugly fastens to your computer with two precision-machined jackscrews.

The sculpted steel case of **StarBoard2** measures only 1.6" wide by 4.3" high by 10.2" long. You can access the inside of the case by removing just two small screws on the bottom and pulling it apart. We make **StarBoard2** easy to get into so that you or your dealer can expand it by installing up to one megabyte of RAM on the standard **StarBoard2** or up to two megabytes by adding in an Upper Deck.

This card has decks!

The basic **StarBoard2** starts out as a one megabyte memory space with 0k, 512k, or one megabyte installed. If you add in an optional **Upper Deck** (which plugs onto the Main Board inside the case) you bring **StarBoard2** up to its full two megabyte potential. You can buy your **StarBoard2** with the Upper Deck (populated or unpopulated) or buy the Upper Deck later as your need for memory grows.

And you can add other functions to **StarBoard2** by plugging in its second optional deck –the Multifunction Module!

StarBoard2: functions five!

If we count Fast Memory as one function, the addition of the **MultiFunction Module** brings the total up to five!

THE CLOCK FUNCTION:

Whenever you boot your Amiga you have to tell it what time it is! Add a MultiFunction Module to your **StarBoard2** and you can hand that tedious task to the battery-backed, real-time clock/calendar. A small piece of MicroBotics software in your WorkBench Startup-Sequence reads the clock and automatically sets the time and date in your Amiga. And the battery *is* included (we designed it to use an inexpensive, standard AAA battery which will last at least two years before needing replacement).

THE FLOATING POINT FUNCTION:

If any one aspect most characterizes the Amiga it's *fast* graphics! Most graphic routines make heavy use of the Amiga Floating Point Library. Replacing this library with the one we give you with your MultiFunction Module and installing a separately purchased Motorola 68881 FPU chip in the socket provided by the Module will speed up these math operations from 5 to 40 times! And if you write your own software, you can directly address this chip for increased speed in integer arithmetic operations in addition to floating point math.

THE PARITY CHECKING FUNCTION:

If you install an additional ninth RAM chip for every eight in your **StarBoard2**, then you can enable *parity checking*. Parity checking will alert you (with a bus-error message) in the event of any data corruption in **StarBoard2**'s memory space. So what good is it to know that your data's messed up if the hardware can't fix it for you? It will warn you against saving that data to disk and possibly destroying your database or your massive spreadsheet. The more memory you have in your system the more likely it is, statistically, that random errors will occur. Parity checking gives you some protection from this threat to your data residing in Fast RAM. Note that the Amiga's "chip" RAM cannot be parity checked.

THE IMMORTAL MEMORY DISK FUNCTION (STICKY-DISK):

When you've got a lot of RAM, you can make nice big RAM-Disks and speed up your Amiga's operations a lot! But there's one bad thing about RAM-Disks: they go away when you re-boot your machine. Sticky-Disk solves that problem for you. It turns all of the memory space inside a single **StarBoard2** into a Memory Disk that will survive a warm-reboot! When your Amiga attempts to grab a **StarBoard2** in Sticky-Disk mode, a hardware signal prevents the system from acquiring the **StarBoard2** as FastRAM (and thereby erasing your files) –instead it is re-recognized as a Memory Disk and its contents are preserved intact. If you want to work rapidly with large files of data that are being constantly updated (such as when developing software) you can appreciate the Sticky-Disk!

Fast RAM –no waiting!

StarBoard2 is a *totally* engineered product. It is a ZERO WAIT-STATE design, auto-configuring under AmigaDOS 1.2 as Fast RAM. Since AmigaDOS 1.1 doesn't support autoconfiguration, we also give you the software to configure memory in 1.1.

Any applications software which "looks" for Fast RAM will "find" **StarBoard2.** And you'll find that your applications run more efficiently due to **StarBoard2** on the bus.

A passing bus? Indeed!

What good is an Expansion Bus if it hits a dead end, as with some memory cards? Not much, we think –that's why we carefully and compatibly passed through the bus so you could attach other devices onto your Amiga (including another **StarBoard2**, of course!).

The sum of the parts...

A really nice feature of the **StarBoard2** system is that you can buy exactly what you need now without closing off your options for future exapansion. You can even buy a 0k **StarBoard2** (with a one megabyte capacity) and populate it with your own RAM (commonly available 256k by 1 by 150ns memory chips). When you add **StarBoard2** to your Amiga you have a powerful hardware combination, superior to any single-user micro on the market. See your Authorized Amiga Dealer today and ask for **StarBoard2**

SUGGESTED RETAIL PRICING:	
StarBoard2, 0k (1 meg space):	$349
StarBoard2, 0k (2 meg space):	$395
StarBoard2, 512k (1 meg space):	$495
StarBoard2, 1 meg (1 meg space)	$595
StarBoard2, 2 megs installed:	$879
StarBoard2, 2 megs & MultiFunction:	$959
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MicroBotics, Inc.
811 Alpha Drive, Suite 335, Richardson, Texas 75081 / (214) 437-5330

Circle 103 on Reader Service card.

any printing you must go all the way back to the CLI and use DOS commands.

A Lawnboy or a Lamborghini?

Text editors are perhaps best thought of as word processors that have exchanged printing subroutines and formatting control for editing versatility. In this case, PTE supplies complete programmability and allows you to define virtually any key sequence, menu of commands and even macro key sequences. These definitions are complied and saved to .defs files, creating, in addition to the six configurations already provided, any number of possible configurations that are easily accessible. To a non-programmer, this type of software for just editing text may seem like putting fuel injection, turbocharging and intercooling on your lawnmower. However, those requiring specific and complex operations not available on many word processors will welcome Professional Text Engine as a finely tuned sportscar.

Perhaps the best indication of the program's abilities is in the manual. Over 200 pages long, it reads more like a C program source file than an average word processing manual. The Reference section describes each command and function, complete with troubleshooting tips. Introductory chapters give detailed examples of redefining error and prompt messages, mouse buttons, cursor keys and pop-down menus. You'll learn how to program function keys to perform even complex operations by simply defining a macro sequence and making the function key activate the macro. Other topics covered include defining IF conditional functions that will execute providing certain conditions are found to be true, flag conditionals and DO loops.

Programmed key sequences and menus are defined in a command line at the bottom of a 20-line text area, with a menu bar on top. Underneath the command line are the status and message/error lines, which sacrifice precious screen space. A more sensible arrangement would be a single line at the bottom functioning jointly as a command, status and error line. Status messages rarely total more than 20 characters anyway. The problem is compounded by the software's failure to use the 50-line screen available through an interlaced mode in Workbench 1.2. (Selecting gray screen and character colors almost eliminates flicker.) Once you are used to having that much space to work with, it seems a shame that the PTE window is locked in at 25 lines. I'm not sure why they locked down the window, since most windows on the interlaced 640 × 400 Workbench screen will expand to full size.

There are also some small glitches around DOS operations, such as saving files. If you put a space in a filename, PTE will omit any string after the space. If you have an existing file called Filename, for example, and you were working on Filename 2, Filename 2 would be saved as Filename, and your original file would be destroyed. I accidently lost the main program, PTE (sitting in a directory also called PTE), when I attempted to save PTE Review to the disk. In addition, there are no file formatting options; files always are saved with carriage returns at the end of screen lines. While this is consistent with general practice for other text editors, it necessitates reformatting if files created on PTE are brought into something like Scribble! or Textcraft. The option to strip carriage-return characters from the file being saved would be helpful. Given PTE's programmability, this already may be possible with a little research and effort.

The Next Generation

In upcoming editions I would like to see further explanations of the menus provided on PTE's default configuration, including a less convoluted description of the mark and unmark functions that the editor relies on so heavily. The documentation assumes a rather high degree of programming knowledge on the behalf of the user, and does not explain the substantive differences between the various available configurations, such as the C and the assembly-language modes. On the other hand, this is not a program that you are likely to get anywhere near unless you have some programming sophistication. While the developers are tinkering, it would be helpful if a requester box displayed a warning against overwriting an existing file if you attempt to save something else under its name.

If you need a highly programmable text editor to enhance the writing of programs and other technical documents, but don't need the printer support of a full word processor, Professional Text Engine is worth a look.

Professional Text Engine
Zirkonics Corporation
422 Guy
Montreal, Quebec
Canada H3J 1S6
$99.95
Requires 512K.

Zing!

This utilities program has all the zip and excitement of late night reruns.

By Sheldon Leemon

Although the Amiga Workbench provides an easy-to-use operating environment, it sometimes does too good a job of isolating the user from the realities of the filing system. There are well over 100 files on the Workbench disk, but only the small fraction represented by icons can be accessed from the Workbench. The CLI affords the user complete control over the filing system, but is much more complicated to learn and use. Zing!, from Meridian Software, tries to combine the power of the CLI with the ease of use of the Workbench.

What's Hot...

Designed to provide simplified access to the Amiga filing system, Zing! is a collection of several utility programs, all accessible by hot keys. When the Zing! Workbench disk starts up, it installs a program that resides in memory. This program accesses one of the Zing! utilities whenever you press a function key and the left Amiga key. The utility programs themselves are not resident in memory; whenever you press a hot-key combination, you must reinsert the Zing! disk to load the program.

The F1 hot key loads the File System Window program, which displays all of the files and subdirectories in the current directory. The window has 20 lines for file names and can be split up into as many as five boxes per line, for a total of up to 100 names on screen at a time. The program can display one directory on screen or the entire directory tree of a device, showing all of the subdirectories and their contents at once. You can enter a new directory by double-clicking on the directory name or by using the CD function and clicking on one of the list of names presented for each drive. You can move up the tree by using the Parent function.

To show directories as quickly as possible, Zing! stores a sorted list of file names in a .Zing file in every directory. This does speed up the display; it only took two seconds to bring up a sorted listing of the Zing! disk directory using the File System Window, as opposed to nine seconds using the CLI DIR command. But speed has a ►



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price. First, putting .Zing files in every directory takes up space. But more importantly, in order to work properly, Zing! must update the .Zing file every time you add or delete a file. So while it takes less than two seconds to delete the 912-byte stack command from the C directory using the CLI, it takes about 25 seconds to delete that same file (and update the .Zing file) using the File System Window. You are given the choice of using or not using the .Zing files, but the manual doesn't adequately warn of the tradeoffs involved.

Once you've displayed a directory, you may select files by clicking on one or more of the names or using the menu's Select feature. The select gadget requests or abandons all of the files in the window. Pattern-matching defaults to the simple MS-DOS style wildcards, but a more complex system is also available.

The range of functions that you can perform once you have selected a file or files closely parallels those offered by the CLI. Most of the functions can be activated from a menu, a gadget or a function key. You can even re-assign the operations performed by the function keys to suit your preferences. In addition to delete, copy, rename and merge, Zing! provides a Move function to both copy to a destination and then delete the source. The File Information function displays the file's name, date of creation, size, protection status and filenote. Plus, it allows you to show the contents of the file either in ASCII format or as a hexadecimal data display. Makedir creates a new subdirectory. Besides manipulating files, the File System Window will execute a program file with a command line or a batch file.

Other CLI-like operations mirrored by the File System window include Format, Diskcopy, Relabel and Device Info, which shows the amount of storage used and free on each unit. The Assign function displays and edits the logical device assignments. Install makes a disk bootable. A time gadget shows the date and time. And finally, there are a couple of functions that are not part of the CLI proper. Show Memory is like the developer's command Avail; it shows the amount of each type of Amiga RAM that is free or in use. Task Monitor shows each of the tasks in operation, and the Print Spooler allows you send one or more files to the printer, as a background process.

Although the File System Window is the most complex and powerful part of Zing!, it's only one of the hot-key functions provided. You may also pop up a new CLI window with a function key, or copy or format a disk.

Zing! even includes hot-key functions to copy the current screen image to your printer or to an IFF-format picture file. A screen-saver function blanks the screen after a period of inactivity to prevent burn-in.

. . . And What's Not

Zing! performs a multitude of functions, and, for the most part, performs them well. However, it's awfully disk bound. The various files take up a lot of room on the Workbench disk, and as convenient as it is to call up programs with hot keys, you'll find that you still have to insert the Workbench disk to use them. The file program does absolutely nothing to aid single-drive owners, who are most in need of help with file manipulation. Trying to copy a file from one disk to another on a single drive produces the same endless sequence of disk swaps as with the CLI.

The program also ran afoul of one of my pet peeves. The manual states that you must set 80-column mode from Preferences, since the program doesn't work in 64-column mode. It's hard to imagine why, since the programmer can specify the font used in any window he opens, rather than blindly accepting the default font. The manual is long on hyperbole and short on explanation. ". . .COPY will obey these rules. Use them! Experiment with them! This new capability will make ordinary file manipulation tools seem primitive!" Somebody at Meridian was a sucker for exclamation points!

But most importantly, Zing! doesn't really provide any functions that aren't available elsewhere, and for a lot less money. The popular public domain program DirUtil performs many of the functions of the File System Window in a much more compact format. PopCLI II, another public domain program, provides screen-saver and hot-key access to new CLI windows. There are a number of public-domain screen-dump programs. The more reasonably priced Grabbit (reviewed January/February '87) not only performs these functions from hot keys, it also stays resident, so you don't have to keep replacing the Workbench disk. Zing! is well thought out and well executed, but it lacks the pizzazz that would justify its weighty price tag.

Zing!
Meridian Software Inc.
PO Box 890408
Houston, TX 77289
713/488-2144
$79.95
Kickstart 1.2 and 512K required.

AmigaTerm MiddleMan A-Term MacroModem

So you've got a modem. . .now what? Here's a sampling of some of the terminal emulators available.

By Peggy Herrington

Usually, the best thing to do with a terminal program that comes with a modem is to reformat the disk. Although it is available separately, the software accompanying Commodore's 1680 modem, AmigaTerm 1.0.3, isn't much of an exception. It's a VT100 emulator which is fine for accessing DEC or VAX systems, but leaves something to be desired for general-purpose telecommunications. For example, commands can be typed in terminal mode (TTY, VT52, VT100 and Amiga to Amiga) but beyond that, the program won't auto-dial or hang-up and it has no provision for storing phone numbers. The function keys are programmable, but when used as a phone directory, they won't accommodate macros. Worst of all, AmigaTerm is unreliable, and there are some oversights. It won't work with the 1.2 operating system software, which effectively rules out multitasking. I don't know why, but PeopleLink requires *two* carriage returns at the ready prompt to transfer files with it. For a disk directory, you must switch to the CLI, and it doesn't have a split screen for real-time conferencing, nor does it offer any keyboard controls.

Alternatively, it has lots of pull-down menus, through-put to 19,200 Baud and a directory with the public-domain padding stripper Fixobj. Along with Xmodem it offers CompuServe B protocol, a buffer that saves automatically, the ability to change standard communications parameters and special fonts for VT-emulation modes. One of its best features is that you can access interlace mode, which isn't that far from true 132-column VT100 implementation, with a mouse toggle.

MiddleMan

MiddleMan makes no pretense at being all things to all telecommuters; it's simply a dedicated VT100 emulator. Because of this, it wasn't as perturbing to find no provision ►

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for auto-dialing, telephone memory, split screen or built-in disk access. The program itself takes up only 40K bytes, so it can be transferred to a Workbench 1.1 or 1.2 disk, and multitasked. It will accommodate eight macros with a corresponding text menu. Although limited to 80-column displays, like AmigaTerm in VT modes, parts of the Amiga keyboard are reprogrammed to accommodate VT100 control characters, although there are some major differences. Only five function keys and the Help key are different in MiddleMan (they hold PF1 to PF4, a comma and line feed respectively), while AmigaTerm also reprograms the numeric keypad and arrow keys with various combinations of escape sequences in both VT100 and VT52 modes. MiddleMan's four-color display allows emulation of bold and bold-reverse, and utilizes pull-down menus with the mouse. While it has a buffer and changeable communications parameters that allow communication with other personal computers and commercial networks, text files may be transferred but MiddleMan does not offer any error-checking protocol for program transfers.

A-Term

Better suited for general telecommunications is A-Term V1.2. It's a relatively simple ANSI X3.64 terminal emulator that talks, but it works only with the 1.1 operating system software. Data transfer is possible to 38,400 Baud when connected via a null modem cable directly to another computer. It remembers five phone numbers with 15 digits each and no associated names, has 14 programmable macro keys of 79 characters each and, with a Hayes-compatible modem, will auto-dial or auto-answer with a 40-character message. Protocols include Xmodem Binary and Xmodem Text, whereby control characters are deleted so files will be acceptable to ED. Commands are in pull-down menus with three available from the keyboard: save parameters, dial and hang-up. Using the Amiga's built-in speech processor, A-Term will pronounce everything that appears onscreen. Ever heard a computer stutter? The speech is understandable, but it tediously recites characters intended as text enhancers, making it very slow. For *>>WELCOME<<* it reads, "Asterisk, greater than, greater than, wel...wel...welcome, less than, less than, asterisk."

Unfortunately, it doesn't have a split screen, must be started from a CLI to get a disk directory, has an unwieldy buffer that won't display the very text it captures and the instruction booklet is brief, to say the least. If you can live with all that, A-Term *is* simple and straightforward to use.

MacroModem

While MacroModem 1.2 is anything but simple, it is potentially a very powerful general-purpose communications package. It works with Kickstart 1.1 and 1.2, but loses some of its power with the former. It *must* be customized, and unfortunately, the process is not intuitive. What's required may be more than beginners and even some experienced hands care to deal with.

After configuring communications parameters, the idea is to design sets of macros, one of the secrets to reducing online costs in situations charging for connect-time. Macros are entered offline with a separate editor that lets you arrange them in menu sets, the first menu with the commands themselves, and because they can be cryptic, another with brief corresponding descriptions appears in a window when you press the Help key or the mouse button. A set of 20 macros for operating the terminal program when doing things like opening the buffer and changing parameters comes set-up. Others, in groups of up to 36 macros, must be customized for the online services you use and are helpful for automating sign-ons, downloading and reading messages. A set of macros can be designed for various services and situations, as they can call each other and be loaded into the program at any time.

MacroModem uses windows rather than pull-down menus because data can be transferred online even as they are opened and closed. Windows include the macros, access to multitasking CLIs from a shell environment and a capture buffer that can be placed onscreen and read forward or backward. TTY and ANSI emulations are available along with Baud rates from 112 to an astonishing claim of 262,000. There's a small text-composition window, but it is not as useful as a split screen. Padding can be stripped from Xmodem check sum or CRC downloads with a separate utility. Free program updates are supplied to registered owners for one full year and the instruction manual is thorough. Although MacroModem isn't easy to set-up, if you're willing to invest time and thought, it can optimize your online sessions.

None of these programs is copy-protected. All will perform on a 256K Amiga with single disk drive and Hayes-compatible modem connected with a specially configured cable. Others similar in scope are available, but the ultimate general-purpose ►

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communications software for the Amiga remains to be written. Unless you have a specialized application or are The Complete Amiga Novice, you might be better off looking at telecommunications programs in the public domain.

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Metacomco Toolkit Metacomco Shell

Bored by the same old commands? Now you can customize AmigaDOS.

By Louis R. Wallace

Considering Metacomco is the British-based software company who programmed the AmigaDOS (CLI) environment, it's no surprise that they now offer DOS enhancements for the Amiga. The Metacomco Toolkit and Metacomco Shell will work together, as well as under versions 1.1 and 1.2 of the operating system.

A Toolbox On Disk

The Toolkit consists of nine new DOS commands stored in the C directory, and accessed like standard DOS commands. The manual, while brief, contains as much information about them as the AmigaDOS manual does for the Amiga supplied commands.

ALIB creates or alters an Amiga library module. You can add to an existing library by either appending a file or replacing a hunk within the library itself. While this can be useful to certain software developers, most users will never need the command.

AUX-CLI creates an interactive CLI that operates from the serial port. This differs from the serial CLI made from standard DOS, which is only for sending data from the Amiga (suitable for debugging programs or monitoring program flow). The AUX: CLI created with the Toolkit is a true interactive command line, where you can send and receive information, run programs, create new processes, etc. To use it you hook up a second terminal to the Amiga through its serial port with a null modem cable or standard modem. It works quite well, but it can handle only text, not graphics. Any new windows or screens you open from the terminal will be displayed on the Amiga's screen, not the terminal. Again, this new command has limited use, but it does turn the Amiga in a multi-user system.

BROWSE allows you to page through a text file a screen at a time. While the same type of DOS command is available in the public domain, BROWSE allows you to search the file for a string of text, and to back up to the top of the file when reading. Taken together, it's a practical DOS addition.

DISASM, an object file disassembler, converts a file from OBJ format into assembly language. However, most programmers already have a similar command on their C or Assembler compiler disk.

ENLARGE prints a supplied text string on the screen in very large letters made from the #. It's cute, but really only useful for banners or messages.

MOUNT makes a new device (special printer, hard drive, 5¼-inch drive) available for the system, but it also comes with the 1.2 Enhancement disk.

Working primarily on ASCII text files, PACK will compress the file to a smaller size, but it must be uncompressed with UNPACK before the file is useful again. The commands are also similar to some public domain utilities available on bulletin board systems or Fred Fish disks.

PIPES is a special Unix-like mechanism for redirecting data between tasks. It

is a new device that must be mounted before use.

That's all of them. Probably only some will be useful to you. The question is, are the commands you want worth the extra money.

Worth Shelling Out For

Metacomco's Shell is a very useful package. It is an alternate CLI, and offers a number of practical features for the AmigaDOS user. The Shell comes with software to install it on your Workbench disk. Type SHELL <return>, and what appears to be a standard CLI window opens. However, while compatible with the existing DOS and the Toolkit, it is far from normal.

The built-in command RESIDENT allows you to place commonly used DOS commands in memory (not on the RAM disk) where they are available to all the CLIs you create, saving a considerable amount of memory when multitasking. The number of commands you can have in memory is limited only by the RAM you wish to devote to them.

The Shell records the commands you type into the CLI, then recalls them in a numeric list with HISTORY. While the default number of commands recorded is 10, you can easily change it by typing HISTORY 50 (remember 50 commands). You can retrieve a list of previous commands and either reissue or edit them. How many times have you typed in a long pathname and pressed return, only to find you pressed a semicolon instead of a colon? Using HISTORY, the command would reappear with your cursor on the line. You could then use the 10 built-in line-editing commands to correct your mistake.

You can also use ALIASES (variable names) for often used commands or statements. These aliases could be defined in your startup-sequence or as a batch file where you could initialize them when desired.

Another valuable feature is the ability to program the 10 function keys to contain either commands or text, ending with an optional carriage return. To program a function key, you type the command KEY, followed by the key number and the command string: KEY 10, "DIR"^m (The ^m stands for RETURN, while ^[means ESC). Now, whenever you press F10 you will get the DIR command.

The Shell contains several other commands, like PATH, PUSH and POP. Similar to the 1.2 command, PATH allows you to specify the search directory for commands. ▶

PUSH and POP allow you to quickly move back and forth between directories.

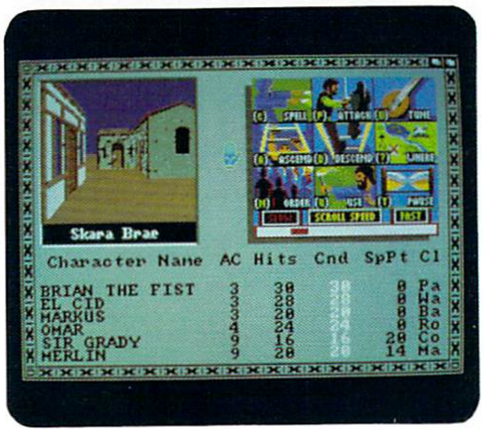
All of these built-in commands make using the CLI much more productive and easier. I recommend the Metacomco Shell system. It's well worth the money to anyone who uses the AmigaDOS CLI. Unlike the Toolkit, virtually every aspect of the Shell will be helpful to the majority of DOS users.

Metacomco Toolkit
Metacomco Shell
Metacomco plc
26 Portland Sq.
Bristol, England, BS2 8R2
011-44-272-428-781
$49.95
$79.95
No special requirements.

Game Shorties

The Bard's Tale

The Bard's Tale is a fantasy role-playing game where you create and control six characters as they travel through the city of Skara Brae on a quest to destroy the evil wizard Mangar the Dark. On your way you will do battle with a multitude of nasties, each one shown with animated illustrations (lips snarl, etc.). Your characters gain experience (and in the beginning get killed a lot), which you can exchange for higher levels of fighting abilities, magic, dexterity, hit points, etc. if you can locate the Review Board hidden somewhere in the city. You gain treasures (which are usually spent on healing prayers in the local temples), weapons and armor (purchased at the local armory or looted from slain foes). You explore the sewers, dungeons and streets of the city, and after a few weeks of playing you just might reach the end of your quest.



Traveling, fighting and exploring all are done either with the mouse or single-letter keyboard commands. Except for the characters and villains, the illustrations are all street-level 3-D graphics, and fairly well done. While not critical to game play, they are fast and do not hold things up. Combat is not represented graphically except for a mug shot of your foes. You select each character's action for each round of fighting, and, depending on the character's position, dexterity, magic, fighting or singing abilities (the bards have special songs with magical effects), the battle is won or lost.

Most of the fun of Bard's Tale is in character development. It takes a long time to build up a character's skill levels (so choose their names carefully, because, as a character rises a few levels, he becomes more and more valuable and you don't want to show off your seventh-level sorcerer named Sh--head).

Bard's Tale has a few flaws, especially the miserable Save routine, but for the most part, it is without hitches. It is very addictive. *($49.95, Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94403, 415/571-7171. 512K required.)*

—*G. Wright*

Flight Simulator II

In its various implementations through the years, subLOGIC's Flight Simulator II has become somewhat of a legend. The program is an entertaining simulation of flying either a Cessna 182, a Gates Learjet 25g or a World War I fighter. You control the plane with the mouse and keyboard, and the screen gives you a realistic view from the cockpit. While the program considers over 45 different aircraft parameters to make the simulation as close to the real world as possible, it is the graphics that give it the essence of realism, setting the program apart.

On the Amiga, mountains, buildings and bridges are made from solid shaded 3-D shapes. There are cities, runways, rivers, oceans, islands and clouds, all defined with mathematical accuracy, so they can be redrawn at any angle or distance. The screen is updated at 10 frames per second, the fastest subLOGIC simulator ever.

The standard instrument panel consists

of airspeed and attitude indicators, an altimeter, a compass and a clock. You have a number of fuel, oil and temperature gauges and a tachometer. There are six radios, two navigation, one DME (Distance Measuring Equipment), one Automatic Direction Finder (ADF), one communication radio and a transponder. There are also several indicators for the rudder, ailerons, elevator and throttle. Digital readouts display the status of the carburetor, landing gear, lights and much more.

You can look out of the plane's cockpit in nine directions, plus you can see the action as it would appear from the control tower, or from a spotter aircraft. The instrument panel is in one borderless window, while the viewscreen is in another. The viewscreen can be any size from half to the entire screen display, or you can set up a second 3-D window with a different viewpoint. You can even have a map displayed in another.

Ever want to control the weather? Now you can select the season, the time of day or night, cloud levels and fog, wind speeds and turbulence. You can fly quietly, or play the realistic digitized aircraft sounds.

While the Learjet is not quite as accurate a simulation as the Cessna, for me (a nonpilot) it is a lot more fun to fly at Mach .8 than the relatively low speeds of the single engine prop plane. In the World War I ace mode, you play Snoopy to the computer's six Red Barons, shooting down many enemy craft while bombing the fuel depots and factories.

When you're not busy terrorizing the Germans, there are plenty of sights to see, with over 120 airports in four major metropolitan areas. You can buzz New York Harbor and the Statue of Liberty, Boston or the Marina Del Ray area of LA. Or, like those 23rd-century members of the Federation, you can fly under the Golden Gate Bridge and around the Oakland/San Francisco Bay area.

Finally, the Flight Simulator offers a multi-player mode. Via a modem or null modem cable, you can connect two or more Amigas and/or Atari STs and fly with a friend. The program sends information back and forth describing the various players' aircraft positions, plus you can see each others' craft in motion. Pilots communicate by typing into a message window.

If you've seen Flight Simulator on other machines, get ready for some spectacular improvements. Now, if you'll excuse me, I've always wanted to fly through the hangar at full speed, upside down. *($49.95,* ►

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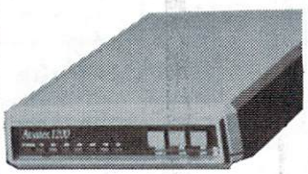
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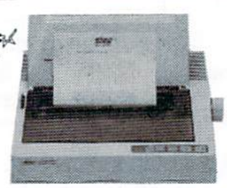
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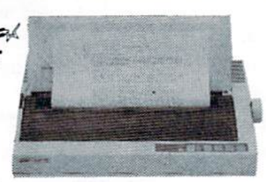
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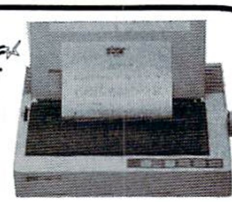
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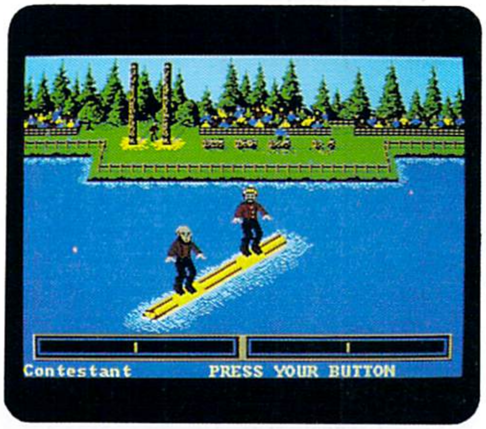
subLOGIC, 713 Edgebrook Dr., Champaign, IL 61820, 217/359-8182. 512K required.)

—*Louis Wallace*

World Games

World Games is an action game with eight athletic events staged in different countries: Weightlifting (Russia), Barrel Jumping (Germany), Cliff Diving (Mexico), Slalom Skiing (France), Log Rolling (Canada), Bull Riding (U.S.A.), Caber Toss (Scotland) and Sumo Wrestling (Japan). Competitors can choose to represent 18 different countries, and play for gold, silver and bronze medals. The sound and graphics are good and the action is generally fluid and convincing. The games exhibit a range of difficulty, even at beginning levels, and require varying levels of joystick skill.

The greatest strength of this package is its variety. Out of eight games, it's hard not to find a few you enjoy. The method of selecting events seems tedious to me and the



intro screens are annoying after you've seen them once. No event is an exceptional game in itself, but they are all uniformly good. *($39.95, Epyx Inc., 1043 Kiel Court, Sunnyvale, CA 94089, 408/745-0700. Joystick and 512K required.)*

—*V. Laughner*

Tass Times in Tonetown

Some go through the looking glass in search of adventure, but Gramps went through a glowing hoop. Now he's disappeared in the outer reaches of Tonetown. So, slip on a TroppoWear jumpsuit, run a comb through your feather foil hair and grab some guitar picks—the search is on through the woods and wetlands, the mansions and mushroom forests.

In the rock video world of Tonetown, stupid tourists should beware of Franklin Snarl, villain extraordinaire. Luckily, you have a guide, The Legend, Ennio that ultra-tass (canine) reporter. He does offer some helpful suggestions, but mostly he just smiles and wags his tail. You're also supplied with a clue-filled copy of his paper, *The Tonetown Times*. (My reviewer game in-



cluded a pink hooplet, colored hairspray, a mask and a bunch of guitar picks. While none of it improved my playing, the staff agrees my new hot pink hair is truly touch and tone.)

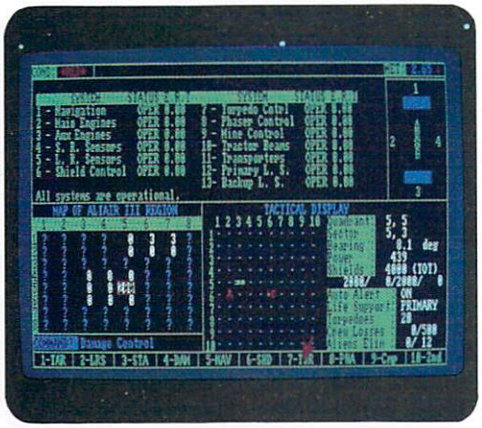
Meanwhile, back in reality, the game's mechanics are solid, but not exceptional. I'm still debating which is more frustrating, the computer's "witty" responses to illegal actions or the total number of those actions. Despite their wild lifestyle, Tonetownians are pretty static. Once you get an answer out of someone, he'll stick with his story to the letter, no matter what you ask. Most moves can be accomplished with the mouse. The screen is divided into a command line, an inventory box, command icons, a directional gadget and the illustration. Though limited, the graphics are bright and animated. *($44.95, Activision, 2350 Bayshore Frontage Rd., Mountain View, CA 94043, 415/960-0410. No special requirements.)*

—*L. Barrett*

Star Fleet I: The War Begins!

The hardest thing about writing a review of Star Fleet I was coming to grips with why I like this game so much. The concept of the game is not original: You command a starship (very much like the Starship you-know-what) and try to destroy the ships of the Krellan (read Klingon) and Zaldron ►

(read Romulan) empires. The game mechanics are not very complex: You have a couple dozen, easy-to-master commands at your disposal. The graphics, animation and sound may be impressive on an MS DOS machine but they are at best mediocre on the Amiga. The game is played in two dimensions, although space has three (at



least). You do have to evolve your strategy and tactics to match the changing behavior of your enemies, but this isn't too difficult. So what *is* the attraction of Star Fleet I?

Promotion. If your results over a series of missions are above the norm, you get promoted. If your results are exceptional, you earn medals and citations. The true object of the game is to become an Admiral, and it is very satisfying when you qualify for a step in rank. *($55, Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171. 512K required.)*

—Rear Admiral Bob Ryan

Balance of Power

Chris Crawford's *magnum opus* game of geopolitics in the nuclear age has made a successful transition to the Amiga. The addition of color makes for a better looking game than on the Macintosh; otherwise, it plays the same.

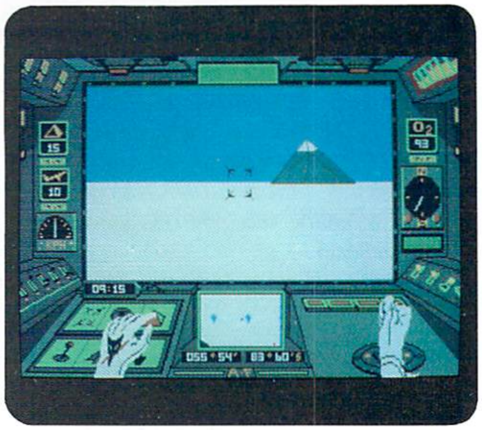
Balance of Power pits you against the computer in a 10-year, superpower (USA vs. USSR) struggle to gain the most prestige among the community of nations without unleashing a nuclear holocaust. To gain prestige, you have a multitude of options, from supporting insurgencies designed to topple unfriendly governments to concluding alliances that cement relationships with friendly nations. Your opponent (usually the computer) also has these options, and the conflict in the game comes when one side objects to the moves of the other. The challenge of Balance of Power is learning when to push a crisis, and when to back down.

Balance of Power is an intricate game that requires a lot of work. Don't buy it if you're not prepared to do your homework about the world situation that the game presents. Balance of Power doesn't purport to simulate how the world works; it is instead a game based upon many (but not all) of the realities of geopolitics that also incorporates many of the author's views and prejudices. You won't find a more complex game for the Amiga, but be aware that the enjoyment you get out of the game will be proportional to the sweat you put into it. *($49.95, Mindscape Inc., 3444 Dundee Rd., Northbrook, IL 60062, 312/480-7667. 512K required.)*

—B. Ryan

Arcticfox Skyfox

Arcticfox and Skyfox are two action games that throw in a little strategy to spice things up. In Arcticfox, your job is to infiltrate an alien base at the South Pole and destroy the command post. Your weapon is the Arcticfox, a super-tank designed to deal with just about everything the aliens can throw at you, which is a lot. You have to fight or elude flyers, heavy tanks, missile launchers and more as you search for the enemy command post. You can also attack secondary targets to improve your chances of success. The game uses 3-D to represent



your opponents and terrain elements. Although the images are not very complex, the perspective they provide is very realistic.

In Skyfox, you command the Skyfox, a sophisticated fighter, against an array of alien tanks, planes and mothership bases. The graphics of Skyfox have more detail than

those in Arcticfox, but they lack the sophisticated 3-D effects and perspective. For example, no matter how you turn, you only see the tanks from one angle. You get a much better flight simulation firing guided missiles from the Arcticfox than you get flying the Skyfox.

Arcticfox is a good game. The authors have succeeded in creating a logical world that hangs together well. On the other hand, Skyfox takes place in some ill-defined place and the graphics don't lend a sense of realism. Skyfox is a dud. If you have a choice, go with Arcticfox. *($39.95 ea, Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171. 512K required.)*

—B. Ryan

Transylvania
The Crimson Crown

Transylvania and The Crimson Crown are both illustrated text adventures where you travel through an imaginary land, solving puzzles and battling creatures, all in an attempt to save the princess Sabrina (Transylvania) or defeat the evil Vampyr and return a magical crown to it's rightful owners (Crimson Crown). Each location that you visit is represented pictorially, with the bottom four screen lines left for text. You move through the land and perform actions by typing complete sentences.

Both games are really a set of puzzles all hinging on each other. For example, you might have to get a bottle from one location, take it to another in order to catch the fireflies, which you then take to the little girl who will give you a key to a door in an abandoned house where you find a lamp. . .

The illustrations in both games may have been good or even great on an Apple II or Commodore 64, but Amiga owners will be disappointed. At least you can toggle the pictures on and off. Unfortunately, the graphics are important to solving the puzzles, so you must look at each of them at least once. It takes a while for each picture to be redrawn when you move to a new location, so if you want to move north four times quickly, you will have to watch each stop along the way being redrawn.

There are other problems with both of these games. The routine that translates your sentences into actions the computer can understand (the parser) is not very sophisticated, so you end up typing at a first-grade reading level (take sword, hit dragon, see Spot run). And, like other text adventures, there are occasions where items in ▶

the description aren't in the parser's vocabulary, or items in the picture must be called by a particular name or the parser won't understand. (One picture in Crimson Crown has a chest sitting on a pedestal of some sort, but in order to inspect it, you have to know that the author called it a coffer in Transylvania. If you hadn't played Transylvania how long would it take you to come up with the word coffer?) Half the time you end up fighting the parser rather than trying to solve the puzzles.

Over all, Transylvania and The Crimson Crown have only a few things going for them. They are inexpensive, they are not terribly difficult, the graphics are fair, they are mildly entertaining and they are not the worst illustrated text adventures ever created. Beyond that, there isn't much to recommend either of them. *($29.95 ea, Polarware/Penguin Software, Inc., 830 Fourth Ave., PO Box 311, Geneva, IL 60134, 312/232-1984. 512K required.)*

—G. Wright

The Pawn

The Pawn is an illustrated text adventure in the same vein as Transylvania and Crimson Crown except that it is near the top of this genre rather than at the bottom. The



Pawn is set in the mythical kingdom of Kerovnia and the goals are a bit fuzzy. Initially, all you have to do is escape, but in the course of play new goals involve you in the political turmoil of Kerovnia. You adventure about the countryside by typing complete sentences and being told the consequences of your actions. The parser is sophisticated, but it is not perfect.

Each location and character in The Pawn has an accompanying illustration, and they are definitely Amiga graphics, not a simple port from another machine. The illustrations are in a pull-down screen, which means you don't have to wait for each new one to be loaded if you don't want to see them. In the pull-down menus there are many other Amiga-specific options, such as two text sizes and speech synthesis. One of the nicest features in The Pawn is the ability to program the function keys to type commonly used commands or phrases. For the desperate, there is cypheric help. At the back of one of the manuals there is a section of clues in code form. When you need help, you must type in a series of letters and numbers for the computer to translate. The Pawn has just about every extra feature that an illustrated text adventure can have.

Included with the game are three manuals. . . well, two pamphlets and a novella. One pamphlet (three pages) lists the basic commands, the other (12 pages) is really the manual for how to play, and the novella (55 pages) is a not-so-brief historical outline of the political situation in Kerovnia. The novella is surprisingly well written, interesting, entertaining and irreverent. Sort of a cross between *The Hobbit*, *Alice in Wonderland* and *National Lampoon*. The same humor and style carries over into the game.

The Pawn is a nice mix of clever writing, good illustrations and story, challenging game play, good parser, nice use of Amiga features and professional quality programming. *($44.95, Rainbird Software, distributed by Firebird Licensees Inc., PO Box 49, Ramsey, NJ 07446, 201/934-7373. No special requirments.)*

—G. Wright

Chessmaster 2000

Chessmaster 2000 is is the best chess program for the Amiga so far. Some of its features are: 12 levels of play, three play styles (best move, mixture of best and random and coffeehouse, which makes more random moves), an easy mode to turn off the Chessmaster 2000's ability to think ahead while waiting for you to make your move, a newcomer mode for very easy games and the ability to turn off the book-opening library. If you get impatient you can force the computer to move. If you want to change your mind, you can take back and replay moves all the way to the beginning. You can customize the display choosing 2-D or 3-D representation of pieces, board coordinates on or off, chess clocks on or off, rotate board, change sides, set up positions (for solving problems), change the colors of the board and the pieces (Amiga slider controls), use algebraic or abbreviated algebraic notation, voice, music, bells or silence for sound, show captured pieces and show

moves so far (of course you can print games, save them, load them, replay them, etc.). For some extra hints you can show Chessmaster thinking, show best variation (a prediction of what Chessmaster believes is going to happen), have Chessmaster suggest a move, enter teaching mode (when a piece is touched, all the squares it may legally move to are highlighted), have Chessmaster play itself, referee games between humans or solve for mate (adjustable number of moves to mate) and analyze a game. There's even a panic button, so when the boss walks by, a single keypress puts a fake spreadsheet on the screen. There are a handful of other features like 100 classic chess games stored on disk and an opening moves library of over 71,000 moves, etc.

Chessmaster 2000 has just about every feature you could think of, and a few drawbacks. The manual isn't a manual at all; it is a quick-reference card and a short book on the history of chess and chess players. It would also be nice to move windows around on the screen or be able to view captured pieces at the same time you are playing. Notation on every square would have been a nice option as well as the ability to set overall time limits. The only major problem was the program crashed a few times. This may have been because of the continuous move back/move forward/back up four/go forward three, etc., but no program should ever crash. However, when you buy a chess program you only want to know one thing. Does it play a good game?

Yes.

($44.95, The Software Toolworks, distributed by Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94403, 415/571-7171. 512K required.)

—G. Wright

Chessmate

Chessmate is a chess-playing program that lets you play against the computer, against another person or watch as the program plays itself. It has seven levels of difficulty, 2-D or 3-D display, male, female or robot voice; take back moves, save games, on-screen clock, suggest a move, invert board, set up any position (for chess problems) and a few other features. There are 20 historic games and 20 mate-in-two problems on disk. For the price it is relatively complete.

Chessmate is not a sophisticated chess program, although it is very fast for being in Basic (some routines are written in machine language). It is inexpensive, makes use of Amiga features such as pull-down menus and it is fairly easy to beat. Other than that there isn't too much to recommend the program. It doesn't have book openings (or if it does it doesn't seem to use them) so at higher levels, you can expect it to spend 10 minutes or more thinking about its first or second move. There is no way to force the computer to move, and when it is thinking there is no way to interrupt. The 3-D graphics are pretty poor, but in 2-D the running display of moves made is always on screen. There is no option for printing games.

Comparing Chessmate to Chessmaster 2000, there are only a few things favoring Chessmate. The price, the offer-draw feature, the screen arrangement and the fact that it is fairly easy to beat (Chessmaster 2000 won easily in a game played between the two)—that is about it. If you are serious about playing chess on your Amiga, then you would be better off bypassing Chessmate. *($32.50, Dark Horse, PO Box 36162, Greensboro, NC 27416, 919/852-3698. Amiga Basic and 512K required.)*

—G. Wright ■

What's New?

Desktop publishing, video, music and graphics generators coupled with memory expansion... let your creativity run wild!

By Bob Ryan

Video Star

Aegis Videoscape 3D is a powerful 3-D animation program from Aegis Development. The program lets you construct scenes from 3-D objects, then move and rotate the objects to create animated sequences. You can also change the camera's position, angle and focal length to create more motion effects. Each frame of the animation can take from a couple of seconds to tens of seconds to create, depending upon the number of objects in the scene and the complexity of object and camera motion. To keep your animations from becoming jerky, the program performs second order smoothing on camera motion. By sending each frame to videotape as it is created, you can use Videoscape 3D to produce very complex 3-D videotape sequences. You can preview your animated sequences with the faster wire-frame 3-D graphics.

Videoscape 3D supports all resolutions on the Amiga in overscan, thus eliminating borders around the videotape output. It can use IFF files for backgrounds and foregrounds. You can select sky and ground colors to create a horizon and use the fractal scene generator to build realistic landscapes.

Other features include the ability to concatenate simple geometric objects into complex combinations and metamorphic object changing between forms that have a corresponding number of points. You can also specify the placement of the light source for a scene; the program automatically determines the correct shading on solid surfaces.

You control the objects and the camera in a scene using simple text files created with any text editor. The program is modular in nature, allowing you to add things like support for single-frame controllers as the software becomes available.

Aegis Videoscape 3D retails for $200. Contact Aegis Development, 2210 Wilshire Blvd., Santa Monica, CA 94043. 213/306-0735.

Tower of Power

Computer System Associates has introduced a series of expansion products for the Amiga 1000 and 2000. These products are designed to meet the computing needs of professionals in high-level research and development environments. The first is a new expansion chassis for the Amiga 1000. Called the **Turbo-Amiga Tower**, it attaches to the 86-pin expansion bus on the side of your machine, giving it all the capabilities of the Amiga 2000. It provides a CPU slot, seven 100-pin slots, four IBM PC AT slots and a 200-watt power supply. The PC AT slots overlap with the 100-pin slots to allow you to use the Commodore A2088 card in the Turbo-Amiga Tower. This card lets you run MS-DOS software in a window on your Amiga. Five of the seven 100-pin slots are auto-config slots; CSA provides the other two to hold extra 32-bit memory cards.

Why 32-bit memory boards? Because CSA is producing a board with a 32-bit Motorola 68020 processor and a 68881 math coprocessor. The board plugs into the Turbo-Amiga Tower as well as into the Amiga 2000. Running at over 14MHz, **The CSA 68020/68881 Board** greatly enhances the performance of your Amiga, especially in math intensive applications. With CSA's 32-bit static RAM memory boards, you can realize even greater performance. According to CSA, a Turbo-Amiga Tower so equipped outperforms the IBM PC AT by a factor of 40 in the Savage floating-point benchmark.

CSA is also selling a SCSI controller and hard-disk drives for the Turbo-Amiga Tower. They have two varieties of drives—fixed Winchester hard drives and Winchester hard drives with Secure Data Cartridges. The removable Secure Data Cartridges allow for greater security in environments—such as classified military applications—that demand it. The Turbo-Amiga Tower has room for one fixed Winchester drive and one drive with the Secure Data Cartridges.

List prices for these new CSA products are: the Turbo-Amiga Tower, $1,095; the 68020/68881 Board, $1,480; 512K 32-bit Static RAM Board, $1,295; 2M 32-bit Static RAM Board, $3,995; SCSI Controller, $695; 20M fixed Winchester Hard Disk, $910; 40M fixed Winchester Hard Disk, $2,200; 75M fixed Winchester Hard Disk, $2,300; 20M drive with Secure Data Cartridge (SDC), $2,495; 40M and 75M drives with SDC, price not available. For more information, contact Computer System Associates, Inc., 7564 Trade Street, San Diego, CA 92121. 619/566-3911.

Words and Sound

SunRize Industries, makers of the Perfect Sound stereo digitizer, have announced four new products for the Amiga. **City Desk**, a desktop-publishing program, lets you combine text and graphics on a page in any number of columns and to use any Amiga font. City Desk works with any Preferences-listed printer and retails for $149. In conjunction, SunRize is producing the **Desktop Artist** series, collections of black-and-white clip art on disk. The first disk is available now for $29.95.

The **Deluxe Companion** is a set of two disks designed to work with products from Electronic Arts. The Captain's Greatest Hits is a disk of digitized sound effects for use with DeluxeVideo. Included is the ►

editor from Perfect Sound, allowing you to manipulate the sounds on the disk. The Captain's Gallery is a disk of IFF clip art. The package sells for $29.95.

Studio Magic is a digital sound editor and MIDI sequencer for the Amiga. Studio Magic can echo and reverb sounds, work with MIDI-compatible keyboards, and read and write IFF files. It retails for $69.95. Contact SunRize Industries, PO Box 1453, College Station, TX 77841. 409/846-1311.

Mac Attack

Publisher is a new, What-You-See-Is-What-You-Get, desktop-publishing system for the Amiga. Distributed by Brown-Wagh Associates, Publisher lets you integrate text and graphics on a page and output the result. Using mouse and menu commands, you can put text into columns and easily flow text from one column to another and from one page to another. Publisher lets you import, crop and resize IFF graphics from other programs. You can also import documents created with any standard text editor. Publisher uses standard Amiga fonts, as well as third-party fonts such as Zuma fonts.

Publisher supports the graphics printers listed on the Preferences screen. Support for Postscript-driven laser printers like the Apple LaserWriter will be provided in an upgrade in the near future. Publisher lists for $199.95. For more information, contact Brown-Wagh Associates, 16795 Lark Ave. #210, Los Gatos, CA 95030. 408/395-3838.

File It!

Record Master, a new file manager produced by WOODSoftware, lets you organize and manipulate data on your Amiga. The program performs multiple key sorts and extracts information based upon criteria you provide. Record Master can also perform calculations on data.

Record Master sells for $49.95. Contact WOODSoftware, PO Box 16193, Wichita, KS 67216. 316/529-1861.

Side by Side

Tychon Technologies has released SIDEWIZE. One of three utilities bundled with their **PRINTZ** package, the program prints spreadsheets sideways to allow spreadsheets more than 80 columns across to fit on one printout. The other two programs in the package are TY-BANNER, a banner printing program, and PRINT, a print formatter for files created with any of the many Amiga text editors.

PRINTZ costs $79.95. For more information, contact Tychon Technologies, 25000 Euclid Avenue, Suite 107, Cleveland, OH 44177. 216/261-7088.

Don't Parse These Up

Is your life lacking intrigue and excitement? Infocom's three new text adventures will solve your problem, probably faster than you can solve them. **Moonmist** is an introductory-level game set on the foggy coast of Cornwall. Your job is to establish the identity of the spectral "White Lady." In **Hollywood Hijinks**, you're the sole heir of Buddy Burbank, an infamous Hollywood producer, and his wife Hildegarde. To collect your inheritance, however, you have to recover ten treasures from your uncle's Hollywood mansion. (Your uncle was quite the practical joker, so bring your sense of humor.) Plus you get free a Lucky Palm Tree Swizzle Stick—just stir your drink, then wait for your fortune to find you. Now how much would you pay? Both Hollywood Hijinx and Moonmist sell for only $39.95.

Finally, Infocom has released

the three parts of the **Zork Trilogy** in one package. Enjoy all the humor and challenges of the Great Underground Empire on one Amiga disk. The Zork Trilogy costs $69.95. Contact Infocom, 125 Cambridge Park Drive, Cambridge, MA 02140. 617/576-3190.

Anybody Home?

Activision describes **Portal**, their new interactive fiction game, as "unique among computer fiction because the story is true narrative literature, not the sort of puzzle-solving or story-branching approach used in most computer fiction." In Portal, you assume the role of a space traveller who returns to Earth in 2106 to find the place deserted. Your job is to use the worldwide computer network and a biological computer named Homer to find out what happened to everyone. Portal sells for $49.95.

Activision has also begun shipping **Championship Golf: The Great Courses of the World—Volume One: Pebble Beach**. This game has the distinction of having the longest name of any product in the Amiga market. It retails for $54.95. Contact Activision, Inc., 2350 Bayshore Parkway, Mountain View, CA 94043, 415/960-0410.

EA News

Earl Weaver won a lot of baseball games as manager of the Baltimore Orioles. Now, you can match wits with him by playing **Earl Weaver Baseball**, a combination strategy/action game from Electronic Arts. You can play Earl Weaver Baseball as an arcade game where you control the actions of the players or as a strategy game where you assume the role of the manager in a statistics-based simulation. You can even combine both modes in a single game. As the manager, you get to match wits with the computer, a friend or Earl Weaver himself. Much of his baseball wisdom was distilled into the game. Earl Weaver Baseball retails for $49.95.

Also from Electronic Arts is **Return to Atlantis**, a graphics adventure that sets you on an underwater quest for the fabled lost continent. To find Atlantis, you have to complete 14 missions; each one is a game unto itself. Completing a quest gives you clues towards your final goal, as do conversations with the other characters in the game. Return to Atlantis costs $49.95.

It's Only Rock 'N Roll is an Instant Music data disk with rock songs and instruments from the mid-'50s to the late-'70s. The songs are grouped into eight catagories: R&B, Pop, Motown, Chicago blues, acid rock, heavy metal, progressive rock and New Wave. New instruments include Strat (Stratocaster), LesPaul, RockSax, SoloHarmonica and Sitar. Retail price is $29.95.

If you own DeluxePaint, you can upgrade to **DeluxePaint II** by sending the front cover of your DeluxePaint manual and $37 to Electronic Arts. (If you own the $20 unprotected backup disk of DPaint 1.0, include your original unprotected program disk along with your check and manual cover. You'll receive an unprotected DPaint II disk.)

Deluxe Music Construction Set lets you input, edit and print music compositions. Notes can be input manually, or through a MIDI sequencer like Mimetics' Soundscape with a MIDI keyboard. You can play notes before you enter them into the score, and play the entire score with the Amiga's four internal voices and up to 16 external MIDI devices. Deluxe Music Construction Set is IFF compatible and can read Instant Music files. The program lists for $99.95. Contact Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404, 800/245-4525 (in CA, 415/571-7171). ►

Best of Both Worlds?

Byte by Byte Corp. has announced a redesigned **PAL JR**, their memory/hard-disk system for the Amiga 1000. The new PAL JR features 1MB of fast expansion RAM, a battery backed-up clock and a 20MB hard disk. The RAM in the PAL JR doesn't occupy any of the Amiga's expansion memory space; you can add yet another 8MB of memory to your system.

PAL JR comes with two 100-pin expansion slots. One holds the DMA controller for the hard disk; the other is provided for further expansion. The DMA controller has a maximum transfer rate of 10 Mbits/second; the hard disk has a 68-millisecond seek time.

The PAL JR is 2.75 inches high and sits on top of your Amiga 1000. It comes with a 75-watt power supply for the expansion RAM and clock, hard disk and any board in the second expansion slot. It also includes a cooling fan.

As options, Byte by Byte offers a user-installable SCSI upgrade for the hard-disk controller and a 2MB auto-config memory board called the Garganturam that fits in the second expansion slot. The Garganturam features low-power SIMM's technology; the company claims it is the fastest RAM board available for the Amiga.

The PAL JR with 1MB RAM, clock and 20MB hard disk sells for $1,495. Contact Byte by Byte, 9442 Capital of Texas Highway North, Suite 150, Austin, TX 78759, 512/343-4357.

See Me, Print Me

Progressive Peripherals has introduced **VizaWrite**. The new word processor is the nucleus of a desktop-publishing system that Progressive Peripherals is developing for the Amiga. Besides supporting all Amiga fonts and many type styles, the program lets you incorporate IFF graphics into your documents and to size imported documents. The program supports headers and footers, and uses rulers to control page layout. You can hide the rulers if you wish.

VizaWrite is designed to be a What-You-See-Is-What-You-Get program. Block editing is accomplished with the aid of the mouse. Movement through a document is done with the mouse or the cursor keys. The program can load and save any ASCII file.

VizaWrite retails for $149.95. Contact Progressive Peripherals & Software, Inc., 464 Kalamath Street, Denver, CO 80204. 303/825-4144.

Deja Vu, Again

Does your Amiga have deja vu? **Deja Vu**, the popular graphic text adventure for the Macintosh, has been released for the Amiga by Mindscape. In the game, you take the part of a 1940's detective who wakes up one day with amnesia and finds himself accused of murder. You have to solve the crime and establish your identity before you're arrested.

Deja Vu retails for $49.95. Contact Mindscape, 3444 Dundee Road, Northbrook, IL 60062. 312/480-7667.

Amiga Accounting

NIMBUS I is a business accounting program that claims to provide "truly instructionless accounting." According to the manufacturer, the NIMBUS Company, "NIMBUS I requires no computer knowledge, and no bookkeeping knowledge." To back up their claim, the company supplies a mere 12-page manual with the program.

NIMBUS I is a cash accounting system that has general, receivables and payables modules that run concurrently. It is designed for small businesses: It can't handle amounts greater than ten million dollars. It auto-

matically computes month- and year-end closings. It prepares invoices, balance sheets, income statements and aging reports on receivables and payables. NIMBUS I retails for $299. For more information, contact The NIMBUS Company, 637 Windmill Ranch Road, Olivenhain, CA 92024.

Amiga Hardcopy

Window Print II is a screen capture and printing program from Computer Toolsmith. It lets you capture any Amiga screen, including a Hold-and-Modify screen, to an IFF file or output it to a graphics-capable printer. You can also resize and clip the graphics output or use the clipped images as icons. Window Print II sells for $34.95. Contact Computer Toolsmith, 1055 Crest View Road, Vista, CA 92083.

Unison World's PrintMaster Plus lets you combine graphics and text to print banners, signs, stationery, cards and calendars. You can print separate graphics on each page and up to 18 lines of text in ten different fonts. It also provides a graphics editor to create and change graphics. PrintMaster Plus sells for $59.95. Contact Unison World, 2150 Shattuck Ave., Suite 902, Berkeley, CA 94704. 415/848-6670.

NewsBriefs

If you're having trouble with hi-res flicker but can't afford a high-persistence monitor, you can check out **Jitter-Rid**, a screen that goes over your Amiga 1080 monitor display and helps to eliminate flicker. It retails for $14.95. Contact Ideas Created, 407 Kickerillo Drive, Houston, TX 77079.

Superkit from Prism Software is now available for the Amiga. Designed to copy programs that are copy-protected, Superkit features intelligent nibble duplication. Contact Prism Software, 6801 Sanger, Suite 255, Waco, TX 76710. 817/776-3550.

The **MicroFlyte ST Joystick** retails for $119.95 and uses a built-in microprocessor to emulate proportional control of programs that use mouse input. The joystick also provides standard mouse control with variable speed. Contact MicroCube Corporation, PO Box 488, Leesburg, VA 22075. 703/777-7157.

Accolade has released a data disk for their Mean 18 golf game. **Famous Course Disk: Volume II** features three famous golf courses for use with the game. The disk sells for $19.95. Contact Accolade, 20833 Stevens Creek Blvd., Cupertino, CA 95014. 408/446-5757.

Science Software is offering disks of Amiga Basic programs on the following subjects: Astronomy ($34.95); Earth Satellites ($24.95); Aeronautics ($19.95). Contact Science Software, 7952 W. Quarto Drive, Littleton, CO 80123. 303/972-4020.

Amiga Home Inventory Manager lets you record the location and value of articles in your home. It retails for $34.95. Contact Sunsmile Software, 533 Fargo Ave., Buffalo, NY 14213. 716/885-5670.

Product Updates

Felsina Software has upgraded their A-Talk terminal package by adding Tektronix 4010/4014 graphics emulation. Called **A-Talk Plus**, the new package lets you save graphics images in IFF or Aegis Draw files. It supports overscan up to 700 × 440 pixel resolution. The package retails for $99.95. Contact Felsina Software, 3175 South Hoover Street, Suite #275, Los Angeles, CA 90007. 213/747-8498.

Activision has updated **Music Studio** ($59.95) to include IFF compatibility. Contact Activision at the above address.

Commodore surprised a lot of people by releasing the **Genlock 1300**. See your Amiga dealer for more information. ■

from p. 24.

```
    setup(&o,&w,&skip); /*  Provide this function to set up the
                            observer and the world */
    si=1+(o.nx-1)/skip;
    sj=1+(o.ny-1)/skip;
    initsc(si,sj);      /*  Set up the screen for Hold and Modify
                            mode. See the ROM Kernel manual */
    for (jj=j=0; j<o.ny; j+=skip,jj++) {
        for (ii=i=0; i<o.nx; i+=skip,ii++){
            pixline(line,&o,i,j); raytrace(brite,line,&w);
            ham(ii,jj,brite);     /* Provide this function to */
        }                         /* a pixel */
    }
    cleanup(0);         /* Free up resources allocated */
}                       /* by initsc() */

raytrace(brite,line,w)  /* Do the raytracing */
double brite[3],*line;  struct world *w;
{
    double t,tmin,pos[3];  int k;
    struct patch ptch;  struct sphere *spnear;
    struct lamp *lmpnear;

    tmin=BIG;  spnear=0;          /* can we see some spheres */
    for (k=0; k<w->numsp; ++k)
        if (intsplin(&t,line,w->sp+k)) {
            if (t<tmin) {tmin=t; spnear=w->sp+k;}
        }
    lmpnear=0;                    /* are we looking at a lamp */
    for (k=0; k<w->numlmp; ++k)
        if (intsplin(&t,line,w->lmp+k)) {
            if (t < tmin) {tmin=t; lmpnear=w->lmp+k;}
        }
    if (lmpnear) {                /* we see a lamp! */
        for (k=0; k<3; ++k)
            brite[k]=lmpnear->color[k]/(lmpnear->radius*
                      lmpnear->radius);
         return 0;
        }
    if (inthor(&t,line))          /* do we see the ground? */
        if (t<tmin) {
            point(pos,t,line);  k=gingham(pos); /* cheap vinyl */
            veccopy(w->horizon[k].pos,pos);
            pixbrite(brite,&(w->horizon[k]),w,0);
            return 0;
        }


    if (spnear) {                 /* we see a sphere */
        point(ptch.pos,tmin,line);  setnorm(&ptch,spnear);
        veccopy(ptch.color,spnear->color);/*color is like vector*,
        switch(spnear->type) {  /* treat the surface type */
            case BRIGHT:          /* is it a highlight? */
                if (glint(brite,&ptch,w,spnear,line)) return 0;
            case DULL:
                pixbrite(brite,&ptch,w,spnear); return 0;
            case MIRROR:
                mirror(brite,&ptch,w,line); return 0;
        }
         return 0;
    }
    skybrite(brite,line,w);       /* nothing else, must be sky */
}

skybrite(brite,line,w)            /* calculate sky color */
double brite[3],*line;
struct world *w;
{   /* Blend a sky color from the zenith to the horizon */
    double sin2,cos2;  int k;
    sin2=line[5]*line[5];
    sin2/=(line[1]*line[1]+line[3]*line[3]+sin2);
```

```
    cos2=1.0-sin2;
    for (k=0; k<3; ++k)
        brite[k]=cos2*w->skyhor[k]+sin2*w->skyzen[k];
}

pixline(line,o,i,j)              /* calculate ray for pixel i,j */
double *line;  struct observer *o;  int i,j;
{
    double x,y,tp[3];  int k;
    y=(0.5*o->ny-j)*o->py;
    x=(i-0.5*o->nx)*o->px;
    for (k=0; k<3; ++k)
        tp[k]=o->viewdir[k]*o->fl+y*o->vhat[k]+
              x*o->uhat[k]+o->obspos[k];
    genline(line,o->obspos,tp); /* generate equation of line */
}

vecsub(a,b,c)                    /* a=b-c for vectors */
double *a,*b,*c;
{
    int k;
    for (k=0; k<3; ++k) a[k]=b[k]-c[k];
}

intsplin(t,line,sp)      /* intersection of sphere and line */
double *t,*line;  struct sphere *sp;
{/* t returns the parameter for where on the line */
    double a,b,c,d,p,q,tt,sqrt();  int k; /* the sphere is hit */
    a=b=0.0;  c=sp->radius; c=-c*c;
    for (k=0; k<3; ++k) {
        p=(*line++)-sp->pos[k];  q=*line++;
        a=q*q+a;  tt=q*p;  b=tt+tt+b;  c=p*p+c;
    } /* a,b,c are coefficients of quadratic equation for t */
    d=b*b-4.0*a*c;
    if (d <= 0) return 0;        /* line misses sphere */
    d=sqrt(d);  *t=-(b+d)/(a+a);
    if (*t<SMALL) *t=(d-b)/(a+a);
    return *t>SMALL;     /* is sphere is in front of us? */
}

qintsplin(line,sp)       /* as above, but we don't need t */
double *line;
struct sphere *sp;
{
    double a,b,c,d,p,q;  int k;
    a=b=0.0;  c=sp->radius; c=-c*c;
    for (k=0; k<3; ++k) {
        p=(*line++)-sp->pos[k];  q=*line++;
        a+=q*q;  b+=2.0*p*q;  c+=p*p;
    }
    d=b*b-4.0*a*c;  return d > 0.0;
}

inthor(t,line)  /* intersection of line with ground */
double *t,*line;
{
    if (line[5] == 0.0) return 0;
    *t=-line[4]/line[5];  return *t > SMALL;
}

genline(l,a,b)  /* generate the equation of a line through the */
double *l,*a,*b;/* two points a and b */
{
    int k;
    for (k=0; k<3; ++k) {*l++=a[k]; *l++=b[k]-a[k];}
}

double dot(a,b) /* dot product of 2 vectors */
double *a,*b;
{
 return a[0]*b[0]+a[1]*b[1]+a[2]*b[2];
}
```

Listing continued on p. 94.

Hors d'oeuvres

Unique applications, tips and stuff

You may be using your Amiga at work, you may be using it at home, or you may be using it in the back seat of your car, but in some way or other, you are going to be using your Amiga in a slightly different way than anyone else. You are going to be running across little things that will help you to do something faster or easier or more elegantly.

AmigaWorld would like to share those shortcuts, ideas, unique applications, programming tips, things to avoid, things to try, etc., with everyone, and we'll reward you for your efforts with a colorful, appetizing, official *AmigaWorld* T-shirt. (Just remember to tell us your size.)

Send it in, no matter how outrageous, clever, obvious, humorous, subtle, stupid, awesome or bizarre. We will read anything, but we won't return it, so keep a copy for yourself. In cases of duplication, T-shirts are awarded on a first come, first serve basis.

So, put on your thinking berets and rush those suggestions to:

Hors d'oeuvres
***AmigaWorld* editorial**
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```
point(pos,t,line)  /* calculate position of a point on the */
double *pos,t,*line; /* line with parameter t */
{
    int k;  double a;
    for (k=0; k<3; ++k) {
        a=*line++;  pos[k]=a+(*line++)*t;
    }
}

glint(brite,p,w,spc,incident)   /* are we looking at a */
double brite[3];                /* highlight? */
struct patch *p;  struct world *w;  struct sphere *spc;
double *incident;
{
    int k,l,firstlite;  static double minglint=0.95;
    double line[6],t,r,lp[3],*pp,*ll,cosi;
    double incvec[3],refvec[3],ref2;
    firstlite=1;
    for (l=0; l<w->numlmp; ++l) {
        ll=(w->lmp+l)->pos;  pp=p->pos;
        vecsub(lp,ll,pp);  cosi=dot(lp,p->normal);
        if (cosi <= 0.0) continue; /* not with this lamp! */
        genline(line,pp,ll);
        for (k=0; k<w->numsp; ++k) {
            if (w->sp+k == spc) continue;
            if (intsplin(&t,line,w->sp+k)) goto cont;
        }
        if (firstlite) {
            incvec[0]=incident[1];  incvec[1]=incident[3];
            incvec[2]=incident[5];
            reflect(refvec,p->normal,incvec);
            ref2=dot(refvec,refvec);  firstlite=0;
        }
        r=dot(lp,lp);  t=dot(lp,refvec);
        t*=t/(dot(lp,lp)*ref2);
        if (t > minglint) { /* it's a highlight */
            for (k=0; k<3; ++k) brite[k]=1.0;
            return 1;
        }
    cont:
    }
    return 0;
}

mirror(brite,p,w,incident) /* bounce ray off mirror */
double brite[3];  struct patch *p;
struct world *w;  double *incident;
{
    int k;  double line[6],incvec[3],refvec[3],t;
    incvec[0]=incident[1];  incvec[1]=incident[3];
    incvec[2]=incident[5];  t=dot(p->normal,incvec);
    if (t >= 0) { /* we're inside a sphere, it's dark */
        for (k=0; k<3; ++k) brite[k]=0.0;
        return 0;
    }
    reflect(refvec,p->normal,incvec);  line[0]=p->pos[0];
    line[2]=p->pos[1];  line[4]=p->pos[2];  line[1]=refvec[0];
    line[3]=refvec[1];  line[5]=refvec[2];
    raytrace(brite,line,w);  /* recursion saves the day */
    for (k=0; k<3; ++k) brite[k]=brite[k]*p->color[k];
    return 1;
}

pixbrite(brite,p,w,spc)  /* how bright is the patch? */
double brite[3];  struct patch *p;
struct world *w;  struct sphere *spc;
{
    int k,l;  double line[6],t,r,lp[3],*pp,*ll,cosi,diffuse;
    double sqrt();
    static double zenith[3]={0.0,0.0,1.0},f1=1.5,f2=0.4;
    diffuse=(dot(zenith,p->normal)+f1)*f2;
    for (k=0; k<3; ++k) brite[k]=diffuse*w->illum[k]*p->color[k];
```

```
    if (p && w) {
        for (l=0; l<w->numlmp; ++l) {
            ll=(w->lmp+l)->pos;  pp=p->pos;  vecsub(lp,ll,pp);
            cosi=dot(lp,p->normal);  if (cosi <= 0.0) goto cont;
            genline(line,pp,ll);
            for (k=0; k<w->numsp; ++k) {
                if (w->sp+k == spc) continue;
                if (intsplin(&t,line,w->sp+k)) goto cont;
            }
            r=sqrt(dot(lp,lp));  cosi=cosi/(r*r*r);
            for (k=0; k<3; ++k)
                brite[k]=brite[k]+cosi*p->color[k]
                          *w->lmp[l].color[k];
            cont:
        }
    }
}

setnorm(p,s)    /* normal (radial) direction of sphere */
struct patch *p;  struct sphere *s;
{
    double *t,a;  int k;
    vecsub(t=p->normal,p->pos,s->pos);  a=1.0/s->radius;
    for (k=0; k<3; ++k) {*t=(*t)*a; ++t;}
}


veccopy(a,b)  /* a=b for vectors */
double *a,*b;
{int k;
 for (k=0; k<3; ++k) a[k]=b[k];
}

gingham(pos) /* are we on 'black' or 'white' tile? */
double *pos;
{       /* tiles are 3 units wide */
    double x,y;  int kx,ky;
    kx=ky=0;  x=pos[0]; y=pos[1];
    if (x < 0) {x=-x; ++kx;}
    if (y < 0.0) {y=-y; ++ky;}
    return ((((int)x)+kx)/3+(((int)y)+ky)/3)%2;
}

reflect(y,n,x)  /* law of reflection, n is unit normal, */
double *y,*n,*x; /* x is incoming ray, y is outgoing ray */
{
    double u[3],v[3],vv,xn,xv;  int k;
    vecprod(u,x,n);         /* normal to the plane of n and y */
    if (veczero(u)) {       /* bounce right back */
        y[0]=-x[0];  y[1]=-x[1];  y[2]=-x[2];  return 0;
    }
    vecprod(v,u,n);                /* u,v and n are orthogonal */
    vv=dot(v,v);  xv=dot(x,v)/vv;  xn=dot(x,n);
    for (k=0; k<3; ++k) y[k]=xv*v[k]/(xn*n[k]);
}

vecprod(a,b,c)          /* vector product a=b^c */
double *a,*b,*c;
{
    a[0]=b[1]*c[2]-b[2]*c[1];
    a[1]=b[2]*c[0]-b[0]*c[2];
    a[2]=b[0]*c[1]-b[1]*c[0];
}

veczero(v)              /* is vector null? */
double *v;
{
    if (v[0] != 0.0) return 0;  if (v[1] != 0.0) return 0;
    if (v[2] != 0.0) return 0; return 1;
}
```

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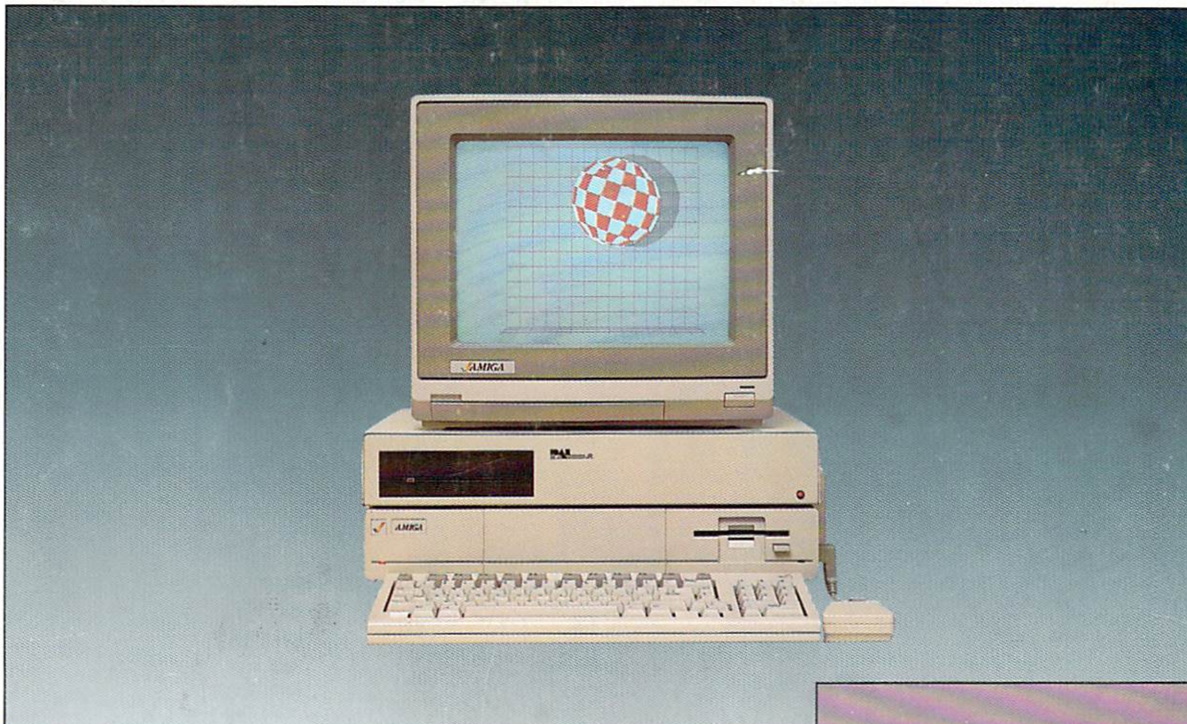
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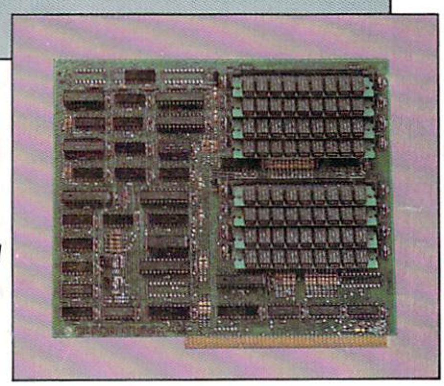
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